THE AMERICAN
JOURNAL OF PHARMACY.

DECEMBER, 1892.

ON THE MEDICAL USES OF COMPRESSED GASES.

By Clement B. Lowe, Ph.G., M.D.

Read at the Pharmaceutical Meeting of the Philadelphia College of Pharmacy, Nov. 15.

Within a comparatively recent period there has been introduced to the notice of the medical profession the use of compressed gases, the principal ones now being used in this way being oxygen and nitrogen monoxide (formerly known as nitrous oxide, or laughing gas).

The medicinal properties of both of these gases have been known for many years. Experiments made upon animals have shown that the inhalation of oxygen produces no injurious effects, but the reverse; they gain in body-weight through the stimulating effects upon the nutritive functions, these results being produced mainly by the effects of oxygen upon the blood through the increase and stimulation of the red corpuscles. The effects thus produced upon animals have been verified by numerous cases reported by physicians of prominence. The chief diseases in which it is indicated are diseases of the respiratory organs, characterized by difficulty in breathing, such as asthma, croup, etc., also in the early stages of phthisis pulmonalis; in chronic indigestion, and especially in asphyxia from poisonous gases, such as carbon monoxide, etc. In the latter case its use may be invaluable; for instance, a person has been found insensible from the inhalation of carbon monoxide produced by imperfect combustion in a stove in a bed chamber. If the carbon monoxide has not been present in sufficient amount to saturate all of the hæmoglobin of the red corpuscles of the blood, recovery takes place, *but very slowly*, it being weeks or months before the patient is restored to normal health. In such a case the

inhalation of oxygen would be of the greatest value, the hæmoglobin being at once changed to oxyhæmoglobin and the blood in the arteries being restored to its bright scarlet color.

The anæsthetic properties of nitrogen monoxide were discovered by Sir Humphrey Davy. It was first used in dentistry by Dr. Wells, of Hartford, Ct., and more recently as a remedial agent by some of the most eminent physicians of the country, Dr. J. E. Blake, and A. McLane Hamilton being prominent among them. It is also being extensively used by medical quacks under the name of compound oxygen. It should be stated that in many cases the latter gas has given better results than those from oxygen. It is stated that one of the best known of New York City physicians has used more than 20,000 gallons of nitrogen monoxide in his practice during the past two years, chiefly in the treatment of nervous diseases. He regards it as a sheet anchor in nervous prostration, insomnia, melancholia, etc.

While, as before stated, the use of these gases therapeutically is not new, the use of them in a compressed form is more recent, as previous to the use of the apparatus devised by the S. S. White Dental Mfg. Co., of this city, which, through their courtesy, I shall have the pleasure of showing you this afternoon, oxygen had to be made by the physician himself, necessitating the use of expensive apparatus, and the loss of valuable time. Even if procured from those who manufacture it for calcium lighting (with but one exception in this city), it would taste of illuminating gas (carburetted hydrogen) on account of the same pump being used to compress both gases.

As the use of these compressed gases shall become more frequent by the medical profession, pharmacists can add to their stock these cylinders, and be ready to supply them at a moment's notice as they would any other remedy, as is already done by a member of our college.

In using the apparatus the compressed gas is first conducted into a rubber bag or a metallic gas receiver, from the former of which it is inhaled under ordinary pressure, the gas passing through a bottle partly filled with water. If to be used as an enema, the gas is displaced from the receiver by water flowing from a can placed about 22 inches above the receiver, and is passed through a bottle, containing warm water, to the patient.

Nitrogen monoxide is used in the same way for inhalation, but when used as an anæsthetic of course the face piece as used by dentists should be employed.

LIATRIS SPICATA.

By William F. Henry, Ph. G.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy. No. 117.

This plant is an indigenous perennial, growing in meadows and other moist grounds throughout the Middle and Southern States. The rhizome is a half inch or more in diameter, slightly wrinkled, of a brown color, externally and internally of a dingy white with streaks of brown. Its odor is somewhat balsamic and its taste warm and bitterish.

A proximate analysis of this rhizome yielded 8·13 per cent. of moisture and 5·35 per cent. of ash.

Petroleum ether extracted from the finely powdered drug 2·80 per cent. This extract consisted of volatile oil 0·09 per cent., fat 0·54 per cent., wax 0·70 per cent., and a substance resembling caoutchouc 1·48 per cent. This substance was insoluble in hot absolute alcohol, but dissolved in chloroform. It was amorphous and of a light-yellow color, which became dark-brown on the addition of concentrated sulphuric acid. Nitric acid produced no change of color, but sulphuric acid and potassium bichromate caused first a dark-brown and then an olive-green color.

The residual drug yielded 3·15 per cent. to stronger ether. This extract consisted mainly of resin, with the exception of 0·88 per cent. of the same caoutchouc-like body that was extracted by petroleum ether. Absolute alcohol extracted from the remaining drug 2·29 per cent. This consisted of resin with some coloring matter. Tests for alkaloids and glucosides were applied to this as well as to the ethereal extract of the drug with negative results.

After the action of the previous solvents, water removed 26·53 per cent. of the drug. Of this 6·03 per cent. were mucilage, 8·65 per cent. glucose, 5·98 per cent. saccharose, and 2·65 per cent. dextrin. The character of the remaining portion dissolved by water was not determined. To other solvents the remainder of the drug yielded 4·86 per cent. of albuminoids, and 16·00 per cent. of inulin.

The conclusions reached by this analysis were that the drug does not possess any compounds of sufficient importance to warrant a belief in its medicinal activity.

ABSTRACTS FROM THE FRENCH JOURNALS.

TRANSLATED FOR THE AMERICAN JOURNAL OF PHARMACY.

Formic aldehyde, according to Berlioz and Trillat (*Compt. rend.*, cxv, 290), is a powerful antiseptic, arresting in very small proportion the development of bacteria, and preventing the putrefaction of animal substances, the gas being rapidly diffused through the tissues. On the other hand, the authors state that the inhalation of the vapor, even when continued for some hours, has no poisonous effect.

Preparation of carvacrol.—A. Reychler obtained (*Bull. Soc. Chim.*, 3 sér., vij, 31) 90 parts of carvacrol from 100 parts of carvol hydrochloride, by heating it with 2 p. anhydrous zinc chloride in the presence of glacial acetic acid, 33 p., whereby the violent reaction is moderated; HCl is evolved, the heat is finally raised to about 120°, most of the acetic acid is then distilled off, the residue washed with water, then distilled and the distillate washed with diluted alkali. Anhydrous carvacrol dissolved in absolute alcohol is not affected by ferric chloride, but if a trace of water be added the solution acquires a green color.

Preparation of pyrogallol.—A mixture of gallic acid, 1 p., and aniline, 2 p., solidifies in a short time. P. Cazeneuve (*Compt. rend.*, cxiv, 1485) heats this mass to 120° C. until CO_2 ceases to be given off, when on cooling aniline pyrogallate will crystallize in long needles; on treating these with benzol or toluol, aniline is dissolved and pure pyrogallic acid remains behind; the melting point of the latter is 132°, not 115°, as is usually stated.

Galactagogue remedies.—From observations made by Miss Griniewitch (Thesis, in *Bull. gén. de Thérap.*, August 30, 1892) it was demonstrated that the herb of *Galega officinalis* (goat's rue), the nettle, cumin, anise and fennel are reliable galactagogues, their activity being in the order named. No undesirable effect was observed from these remedies, either upon the women, while taking the medicine, nor the children whom they nursed. The milk was normal in density, a slight increase of fat being noticed. The herbs

may be given in the form of extract, while anise and the other fruits may be taken in powder in doses of 1 gm., from twice to five times a day.

Elimination of strontium bromide.—Dr. Féré reported to the Biological Society, at the June meeting, that this salt is rapidly and completely eliminated by the urine, and though this elimination begins later, there is less accumulation of this salt in the system than of potassium bromide. See also Amer. Jour. Phar., 1892, p. 136.

Effects and uses of strontium salts.—In an essay upon the physiological effects and therapeutic uses of these salts (abstract in *Revue internat. de Bibliogr. méd.*, October 10, 1892, p. 330), Dr. Armand Malbec, of Paris, states the adult dose of the *lactate* to be from 2 to 10 gm., while the *bromide* and *iodide* may be given in the same doses as the corresponding potassium salts; the *sulphate* and *phosphate* being insoluble may be given in wafers, or mixed with food, or preferably in the form of biscuits. The author finds the salts to be non-poisonous; they appear to facilitate the nutritive acts in the organism, more particularily the *lactate*; to sensibly augment the intravascular tension on the one hand, and on the other hand to retard the peptonization of the albuminoids, thus effecting a favorable action in certain pathological conditions.

The author regards the *lactate* as being indicated in certain forms of albuminuria and also in gastric affections, characterized by hyperpepsia with accompanying pain; it may even advantageously replace the alkali bicarbonates. *Bromide of strontium* is a substitute for potassium bromide, is better tolerated by the stomach and does not cause the condition of bromism. *Strontium iodide* should be preferred to potassium iodide as a cardiac and circulatory medicament, in case the latter be not well tolerated.

Strontium nitrate is a good diuretic. *Strontium sulphate* and *phosphate*, notably the latter, may be utilized as antiseptics, antiparasitics and restoratives.

Strontium phosphates.—L. Barthe has prepared the following (*Compt. rend.*, cxiv, 1267):

On adding a cold ammoniacal solution of sodium phosphate, 90 parts, to ammoniacal solution of strontium chloride, 100 p., amorphous

normal strontium phosphate, having a bluish tinge, is precipitated; dried at 100° C. it is anhydrous.

On using acidulated solutions of strontium chloride, 70 p., and sodium phosphate, 100 p., at a temperature not exceeding 50° C., a gelatinous precipitate of *distrontium hydrogen phosphate* is produced, gradually becoming granular, and by the heat of the blow-pipe is converted into bluish *pyrophosphate*. Its solution in cold phosphoric acid concentrated below 50° C., yields tabular crystals of $2SrO,H_2O$, $3P_2O_5+7H_2O$, which are soluble in water.

Equal volumes of decinormal solutions of phosphoric acid and strontium oxide yield a precipitate having the composition $SrH_4(PO_4)_2+2H_2O$.

Barium chloride, according to Dr. Lelli, exerts a harmful influence upon certain forms of scrofula; but the gastritis of scrofulous children is generally modified after a few days, the diarrhœa diminishes, and a cure is effected in from two to four weeks; at first, the remedy has an irritating effect upon the mucous membrane of the intestines. The author prescribed the salt to children, according to their age, in doses of 0·03 to 0·20 gm., to be taken after a meal.—*La Médecine moderne.*

Arsenic cyanide, $AsCy_3$, has been prepared by E. Guenez (*Comp. rend.*, cxiv, 1186), from powdered arsenic and excess of dry cyanogen iodide in the presence of carbon bisulphide, the mixture being finally heated on a water-bath, and the minute yellowish crystals freed from arsenic iodide by washing with carbon bisulphide. Arsenic cyanide is rapidly decomposed by moisture into arsenious and hydrocyanic acids; on heating a portion of the cyanogen is given off, paracyanogen and arsenic remaining behind. Iodine converts the compound into arsenic iodide and cyanogen iodide, and the mixture with potassium chlorate is violently explosive.

Cholesterin, prepared from phanerogamous plants, according to Gérard (*Compt. rend.*, cxiv, 1544), agrees in its properties with Hesse's phytosterin, melts at 132° C., and after complete drying at 135°, the rotatory power being at the same time increased from — 34·4° to — 36·5°. It is obtained by preparing an extract with ether, saponifying it with alcoholic potassa, exhausting the dried soap with ether and evaporating; the acicular crystals are again treated with potassa, and the alkaline watery solution agitated with chloroform. The crystallized

cholesterin may be still further purified by converting it into the benzoate, crystallizing repeatedly from alcohol and saponifying.

Prepared from cryptogamous plants by a similar process, cholesterin gives the reactions of Tanret's ergosterin, but the melting point and the rotatory power differ to some extent.

The physiological action of cinchonamine has been studied by Dr. Chauin. In a report to the Biological Society the author stated (*La Tribune médicale*) that this alkaloid has a toxic action upon animals and effects a considerable reduction of temperature in animals which had been rendered feverish by inoculation, or by the administration of chemical compounds.

Recognition of nickel in presence of cobalt.—L. Lafay (*Journ. de Pharm. et de Chim.*, 1892, 24, p. 67) publishes a method for the recognition of these metals which is based on the following reaction: Prepare a 5 per cent. solution of chloride of cobalt and add an equal volume of a concentrated solution of potassium bichromate and a large excess of ammonia; on adding to 4 or 5 cc. of this solution a large excess of solution of potassium hydrate, a precipitate is formed which redissolves in the liquid forming a greenish and limpid solution. A salt of nickel treated in like manner yields a precipitate which does not redissolve. In case of a mixture of the salts potassa yields a precipitate from which the cobalt is extracted by a large excess of the precipitant.

Dermatol in purulent otorrhœa.—Dr. Chaniavsky (*Med. Obozr.*, through *Nouv. Remèdes*, 1892, 408) treats purulent otorrhœa in the following manner: The ear is washed with an aqueous solution of boric acid, and then some absorbent cotton on which dermatol is placed is inserted.

A new antiseptic mixture.—Dr. Cavazzini (*Rif. Med.* through *Nouv. Remèdes*, 1892, 436) recommends for dressings the following antiseptic powder: Iodoform 55 parts, salicylic acid and bismuth subnitrate each 20 parts, camphor 5 parts. The powder is of a yellow color and free from disagreeable odor. Torpid and fungoid granulations are favorably influenced and suppuration is greatly diminished.

Treatment of croup.—Dr. Bonain (*Rev. laryng., otolog. et rhinolog.*, Aug., 1892) advises the following treatment of cases of croup: (1) Potion: lactic acid, 3 gm.; syrup of tolu, 50 gm.; water, 100 gm.

Dose—half a teaspoonful every hour. (2) Inhalations of a coffee-spoonful of the following mixture every two hours: carbolic acid, 1 gm.; alcohol (90 per cent.), chloroform, each 10 gm. (3) Injections with a Pravaz syringe morning and evening into one of the infra-spinous fossa: oil of turpentine, 2 gm.; paraffin oil, 10 gm.

Digestive ferment in Anagallis arvensis.—Daccamo and Tommasi (*Rev. Thérap.*, 1892, 470) found a digestive ferment in anagallis arvensis by reducing the fresh plant to a pulp and keeping in contact with fresh meat and fibrin. At the end of thirty-six hours the fibres were completely separated. The authors obtained the ferment in the form of a white, amorphous mass, which is readily soluble in water, and has no action on starch.

Hypodermic injections of digitalis in treatment of cardiac affections.—In a number of cases of cardiac affection which rebelled against every treatment, and in which digitalis, given by the mouth, was ineffectual, Dr. K. Zienitz (*Med. Obozr.*, 1892, 37, p. 922, through *Nouv. Remèdes*, 1892, 419) had recourse to hypodermic injections of digitalis. He used an infusion of digitalis (0·3 to 10 gm.), of which he injected two syringefuls twice a day.

Preparation of cantharidin.—Debuehy (*Jour. de Pharm. et de Chim.*, 1892, 24, p. 13) advises the use of methyl-formic ether in place of acetic ether, chloroform, etc., for extracting the cantharides, and petroleum ether for washing the impure cantharidin in place of carbon bisulphide.

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Moerk, Ph.G.

Thiosinamine or allyl sulphocarbamide, $CS\,NH_2\,NHC_3H_5$, a compound known for many years, has been used very successfully during a two years' trial by Dr. v. Hebra in the treatment of lupus, and has also been found to exert a powerful and favorable action in reducing glandular tumors. Thiosinamine is made from volatile oil of mustard (allylisosulphocyanate), by treatment with ammonia. The crystals have a bitter taste and a faint odor resembling oil of mustard, and are easily soluble in hot water, alcohol and ether. Injections of a 15 per cent. (alcoholic) solution form the method of using; immediately after the injection a burning pain is felt, which, however, is of short duration.—*Oesterr. Ztschr. f. Pharm.*, 1892, 695.

Estimation of quinine in cinchona barks.—20 grams of the finely

powdered, air-dried bark are macerated, with frequent agitation, for 24 hours with a mixture of 10 cc. water of ammonia (sp. gr. 0·960), 20 cc. alcohol (90 per cent.) and 170 cc. ether; 100 cc. of the clear liquid are then transferred to a beaker, 27 cc. water and 3–4 cc. normal hydrochloric acid solution added and set aside for 24 hours to allow the ether to evaporate; by placing the beaker in a water-bath the alcohol and ammonia are next dissipated, adding, if necessary, sufficient hydrochloric acid to assure a neutral or faintly acid solution (should too much acid be added the excess is neutralized by the addition of *cinchonine*, thus preventing the introduction of ammonia or fixed alkaline hydrates). The liquid at this stage should measure about 15 cc. (greater concentration in presence of free acid frequently causes decomposition); after cooling a red-brown coloring matter generally separates, which is filtered out, and in the filtrate is then dissolved 2–3 grams Rochelle salt, the solution heated upon a water-bath for fifteen minutes and set aside for 24 hours. After filtering off the insoluble tartrates of quinine and cinchonidine (the filtrate is proven to be free from these alkaloids by warming with a little additional Rochelle salt), the tartrates are washed with as little water as possible and then drained; for each cc. of original filtrate an allowance of 0·0008 gm. quinine, and for each cc. of washings an allowance of 0·0004 gm. quinine must be made. The tartrates are dissolved in water, using the smallest possible quantity of hydrochloric acid; this solution is thoroughly extracted with ether to remove soluble substances, and made alkaline with sodium hydrate and now the alkaloids (quinine and cinchonidine) extracted by agitation with ether; this ethereal solution is evaporated and the residue dried at 100–110° C. and weighed. By treating this alkaloidal residue with a saturated solution of cinchonidine in ether, the quinine is dissolved; after decanting the solution, the residue is quickly washed with a few cc. of pure ether, and dried at 100–110° C. to constant weight. To the difference between the two weighings must be added the correction for the solubility of the tartrate of quinine and the sum represents the quinine in 10 gm. of the bark. The quinine in the ethereal solution can be converted into tartrate, which will be beautifully white and suitable for polarization or for de Vry's method of estimation.—J. H. Schmidt (apothecary in Soerabaya), *Pharm. Centralhalle*, 1892, 594.

Losophan or *tri-iodo-meta-cresol* is prepared by the action of iodine upon *m*-oxytoluic acid in the presence of the calculated quantity of alkaline hydrate or carbonate; the carboxyl group, present in the acid, suffers oxidation to carbonic oxide and the new compound, $C_6HI_3.CH_3.OH$, results. It appears in the form of white needles, melting at 121·5° C.; it is difficultly soluble in alcohol, but readily soluble in ether, chloroform, benzol and at a temperature of 60° C. also in fixed oils; dilute sodium hydrate solution dissolves it, but a concentrated solution changes the losophan into a greenish-black, amorphous body. The preparation contains about 80 per cent, iodine and upon ignition yields copious iodine vapors. Solutions in dilute alcohol (50 per cent.) are subject to decomposition, but a solution in 75 per cent. alcohol remains unchanged for considerable periods. Saalfeld has used a one per cent. alcoholic solution or a 2–3 per cent. ointment (containing petrolatum or a mixture of lanolin 80 per cent. and petrolatum 20 per cent. as the base) with success in skin diseases (Herpes tonsurans, Pityriasis versicolor, etc.).—(*Therap. Monatsh.*) *Pharm. Centralhalle*, 1892, 613.

Cocaine cantharidate, made according to directions of Hennig (by union of 2 molecules cocaine hydrochlorate with 1 molecule cantharidin dissolved in 2 molecules NaOH), is not a chemical compound, but merely a mixture from which the sodium chloride, however, is removed by an unpublished process; it is claimed to have notable therapeutic advantages over the cantharidates in the treatment of pulmonary tuberculosis and chronic catarrhal affections of the air passages. The remedy presents an amorphous, white, odorless powder of unpleasant, pungent taste; it is soluble in boiling water and insoluble in alcohol, ether and benzin. Because of greater stability the following solution is recommended for subcutaneous injections: cocaine cantharidate 0·075–0·15 dissolved in chloroform water 50·0; the dose representing $\frac{1}{10}$ milligram cantharidin.—(*Berl. Klin. Wochenschr.*) *Apotheker Ztg.*, 1892, 522.

Tetrathiodichlordisalicylic acid $(C_6HCl\,(OH)\,CO.OH)_2\,S_4$ made by slowly heating 27·6 salicylic acid with 55·0 sulphur chloride to 120° C. and later to 140° C., is stated to have antiseptic properties; it softens at 150° C. and at 160° C. is completely melted.—*Pharm. Centralhalle*, 1892, 648.

A chlorine derivative of antipyrine, to be used therapeutically, according to a patent application, is made by acting upon antipyrine with hydrochloric acid and bleaching powder. It has the formula $C_{11}H_{12}H_2O_3Cl_2$, is insoluble in water, dilute acid, ether, chloroform and ligroin, but soluble in hot alcohol and glacial acetic acid; in alkalies it is soluble with decomposition; heated to 228° C. it melts, charring and giving off hydrochloric acid vapors. By heating in a current of chlorine, or passing chlorine through the acetic acid solution and by heating with hydrochloric acid or alcohol to 150° C. it is converted into dichlor-methyl-phenyl-pyrazolon which then can be easily reduced to methyl-phenyl-pyrazolon.—*Apotheker Ztg.*, 1892, 532.

Constituents of Lolium temulentum, L.—An analysis of the seeds of this plant by Hofmeister corrects the results announced by Dr. P. Antze (Am. Jour. Pharm., 1891, 568). The volatile alkaloid "*loliine*" was found to be impure ammonia; the so-called "*temulentine*" was also found to be a mixture containing some of the narcotic principle which Hofmeister isolated and called *temuline*; "*temulentic acid*" is at present considered by Hofmeister to be a mixture of the acid tartrates of ammonium and potassium. Hofmeister's *temuline* is not crystallizable, is very likely a pyridine derivative, is soluble in water, has an alkaline reaction and eagerly absorbs carbonic oxide. The crystallized hydrochlorate has the formula $C_7H_{12}N_2O.2HCl$. The amount of temuline present in the seeds is approximately 0·06 per cent. The author also determined the presence of an acid containing nitrogen, and of an uncrystallizable alkaloidal body; by decomposing the platinum double salt of the latter, a mixture of temuline hydrochlorate and an uncrystallizable syrupy body were obtained. Physiological experiments established that temuline is a peculiar nerve poison causing stupor and paralytic weakness.—(*Arch. f. exp. Path.*) *Apotheker Ztg.*, 1892, 544.

Dulcine is a product which, because of its intense sweetness and its non-poisonous character, seems destined to become a serious competitor of saccharine; it was prepared first in 1883 and its sweetening power then recognized; but the cost of manufacture was too great. Patents have now been applied for its preparation from *p*-phenetidine by the action of ammonia and carbon oxychloride. The chemical name for the compound is *p-phenetol-carbamide* and its formula $C_6H_4\ (OC_2H_5)\ NHCONH_2$.—*Apotheker Ztg.*, 1892, 550.

Oil of Allium sativum.—From 900 kilos bulbs only 800 gm. oil were obtained, a yield of 0·09 per cent.; the oil has a yellow color and an intense characteristic odor, and is optically inactive; sp. gr. at 14·5° C. = 1·0525; exposed to artificial cold a very small quantity of minute crystals separated; upon heating to 150° C. decomposition ensues with the evolution of very offensive gases. By fractioning under greatly reduced pressure (16 mm.) the following compounds were obtained: $C_6H_{12}S_2$, about 6 per cent., sp. gr. 1·0231 at 15° C., boiling point 66–69° C. at 16 mm. pressure; $C_6H_{10}S_2$ about 60 per cent., sp. gr. 1·0237 at 14·8° C., boiling at 135–139°; $C_6H_{10}S_3$ boiling at 112–122°, 16 mm. pressure; and $C_6H_{10}S_4$ boiling above 122° C., but decomposing during distillation. The compound $C_6H_{10}S_2$ purified by distillation over a little metallic potassium, boils at 78–80° C., 16 mm. pressure; it gives precipitates with mercuric, platinic and gold chlorides. The oil was found free from allyl sulphide and sesquiterpene, which have been claimed to be present. *Pure allyl sulphide* made for comparison with these fractions is a colorless oil, sp. gr. 0·8991, at 16° C., boiling under 750 mm. pressure at 136–140° C., under 15·5 mm. at 36–38° C. All of the sulphur compounds of the oil, when distilled under ordinary conditions, suffer decomposition.

Oil of Allium Cepa, L.—5,000 kilos of onions only yielded 233 gm. oil 0·005 per cent., of a dark brown color, mobile, sp. gr. 1·041 at 8·7° C.; laevogyre; on exposure to freezing mixtures separating a small quantity of lustrous crystals. Distilled under ordinary pressure the oil decomposes at 160° C., emitting gases of very offensive odor; under 16 mm. pressure the oil can readily be distilled. The chief constituent is $C_6H_{12}S_2$, boiling at 75–83°, at 10 mm.; specific gravity 1·0234 at 12° C.; distillation with a little metallic potassium yields it colorless, with larger quantities of potassium there results colorless $C_6H_{14}S_2$, boiling at 68–69° C., 10 mm. pressure; by oxidation it yields carbonic, oxalic, sulphuric, propionic, formic and acetic acids. There is present also a higher sulphur derivative, which, by reduction, yields $C_6H_{12}S$. In the fraction above 100° C. is present a sulphur compound probably identical with a constituent of asafœtida oil. All fractions of the oil give, with mercuric, platinic and gold chlorides, white, resp. yellow precipitates. Allyl sulphide, hexenyl sulphides and terpenes were not found in the oil.—F. W. Semmler, *Archiv der Pharm.*, 1892, 434–438.

Borneol acetate, a constituent of the oils of *Abies sibirica* and *A. pectinata*. These oils yield fractions, all (from the former oil amounting to 25 per cent.) soluble at 17° C. in 3·6 volumes of 70 per cent. alcohol and having the sp. gr. of 0·979 at 20° C., the saponification equivalent 267·5 and the boiling point 210–220° C. De rived of water this fraction crystallizes; the crystals melt between 27–28° C. and boil at 210° C.; in alcoholic solution they are laevogyre. By saponification of these crystals both borneol (the laevogyre variety) and acetic acid were identified. As no other ester is present in this oil, it offers the best material for making laevogyre borneol. A qualitative test proved the presence of the same ester in *A. pectinata*. The oil of *Pinus canadensis* reacting very much like the above oils, probably contains this same constituents.—E. Hirschsohn, *Pharm. Ztschr. f. Russl.*, 1892, 593.

Detection of resin as an adulterant of dammar.—The test depends upon the property of resin to dissolve readily in water of ammonia and upon the addition of acetic acid to reprecipitate; powdered dammar agitated with water of ammonia gives a yellow or red filtrate, which, with acetic acid, remains clear or becomes only slightly opalescent. The ammoniacal filtrate (2 gm. to 20 cc.) acidified with acetic acid gives from a mixture containing 5 per cent. resin a separation of some floccules; 10 per cent. resin yielded a heavy separation; 20 per cent. resin caused the test to form a gelatinous mass so that it could not be filtered.—E. Hirschsohn, *Pharm. Ztschr. f. Russl.*, 1892, 609.

Recently powdered metallic arsenic which, in the process of powdering, had been moistened with water to prevent dusting, is recorded by E. Hirschsohn as capable of spontaneous combustion. A quantity of powdered arsenic in a double paper bag had been received late in the evening, and set aside over night in a basket containing other articles packed in straw and sawdust. The next morning, upon opening the store, the peculiar garlic-like odor attracted attention to the basket containing the powdered arsenic; an examnation disclosed that the arsenic had agglutinated to a solid, glowing mass; that the paper containers had been charred, and that a portion of the straw was scorched; a number of bottles in the basket had also burst, owing to the high heat, and upon the charred paper bag were sublimed some beautiful crystals of arsenious oxide. A fire,

which probably would have been attributed to some other cause, was in this case averted —*Pharm. Ztschr. f. Russl.*, 1892, 612.

Estimation of urea.—2·5 cc. urine are mixed in a stoppered flask with 2·5 cc. of a solution containing 50 gm. barium hydrate and 350 gm. barium chloride in a litre; 75 cc. of a mixture of 1 volume ether and 2 volumes alcohol (90 per cent.) added, agitated and set aside until the next day. It is then filtered into a porcelain capsule, the precipitate washed with 50 cc. of the ether-alcohol mixture and the ether-alcohol evaporated on a water-bath at 50–60° C. until about 20 cc. remain. (Should the urine show a high specific gravity, about half a gram of magnesium oxide must be added during this evaporation.) 10 cc. concentrated sulphuric acid are next added and the water-bath raised to 100° C.; after the liquid ceases to evaporate it is transferred and rinsed into a Kjeldahl flask, and this heated upon wire gauze until perfect solution has taken place (which requires several hours). After adding an excess of sodium hydrate the ammonia is distilled, collected, titrated and calculated to nitrogen, which, multiplied by 2·14, gives the urea present in the urine.

This method of Mörner and Sjöqvist somewhat altered by E. Bödtker depends upon the precipitation of all nitrogenous substances except urea and a little free ammonia; during the evaporation the latter escapes (liberated by the $Ba(OH)_2$ or later by the MgO); by the heating with sulphuric acid urea is decomposed, all of the nitrogen going to form ammonium sulphate; the latter by the sodium hydrate is then decomposed, collected, titrated and the results calculated from this.—*Ztschr. f. physiol. Chemie*, 1892, 140.

Assay of crude carbolic acid.—The method published in Am. Jour. Pharm., 1892, 566, has been criticised as not giving reliable results, the chief source of error being due to the fact that no allowance is made for the solubility of the phenols in the salt solution. P. Solmann, in Pharm. Ztg., 1892, 679, gives a method carried out by distilling 100 cc. of the crude phenols and measuring the fractions, allowance being made for water which may be present to the extent of 10 per cent.; the method is stated to be used by the manufacturers in determining the quality of the acid before offering it for sale; the assay can be completed in half an hour. The results obtained in the analysis of three samples will explain themselves:

	I.	II.	III.
Boiling commenced, ...	103° C.	100° C.	100° C.
Distillate up to 160° C., ...	9·5	9·0	11·0 cc.
(including, ...	1·5	7·5	9·0 cc. water.)
" " 185° C., ...	2·5	2·0	1·0 cc.
" " 195° C., ...	38·0	49·0	70·8 cc.
" " 200° C., ...	30·0	30·5	11·5 cc.
" " 205° C., ...	16·0	3·7	2·8 cc.
	96·0	94·2	97·1 cc.
Less the water, ...	1·5	7·5	9· cc.
Phenols soluble in alkali, ...	94·5	86·7	88·1 cc.
Tar oils by difference, ...	4·0	5·8	2·9 cc.

Acetanilide can now be purchased of such purity that the solution in sulphuric acid will stand for hours without showing coloration; one gram boiled with 30 cc. water and one drop of a permanganate solution added will retain the red color for five minutes. Dried at 105° C. it has the melting point of 114° C.—*Pharm. Ztg.*, 1892, 636, 674.

Purification of extract of liquorice.—The extract broken into small pieces is dissolved in 6 or 7 times its weight of water, stirring facilitates the operation; into this solution while being stirred there is sifted powdered talcum (in amount equalling $\frac{1}{3}$ of the extract taken) and then a quantity of water of ammonia (sp. gr. 0·960) added sufficient to impart a faint odor ($\frac{1}{50}$ of the weight of the extract is generally sufficient); lastly, a weight of 90 per cent. alcohol is added equalling $\frac{1}{6}$ of the weight of the extract; after continued agitation for 10–15 minutes the vessel is closed and set aside for 1½–2 days to allow the suspended matter to subside; the supernatant liquid will be found perfectly clear, and is separated by decantation; the turbid portion is diluted with water, filtered and washed, and the clear solutions are then evaporated. Another method, although an inferior one, differs from the above by using powdered glycyrrhiza, instead of the powdered talcum (10–12·5 per cent. of the weight of the extract) the separation requires longer time and the sediment becomes more troublesome in washing. In these processes the powders are added to attract the suspended matter and cause them to deposit; the ammonia is added to dissolve free glycyrrhizin which is always present, and the alcohol to facilitate separation of the suspended albuminoid matter also to prevent fermentation; in hot weather a larger proportion of alcohol may be required for this purpose.—H. Hager, *Pharm. Ztg.*, 1892, 650.

AMORPHOUS BORON.[1]

By H. Moissan.

A summary of the properties of pure amorphous boron. Boric acid is twice treated with less than the theoretical quantity of magnesium powder, and the product, on treatment with an acid, leaves amorphous boron.

Amorphous boron is a bright, maroon-colored powder which stains the fingers and can be compressed into a cake. Its sp. gr. is 2·45. It does not fuse at the temperature of the electric arc, but shrinks slightly and increases in density when heated to 1,500° in an atmosphere of hydrogen. Its electrical conductivity is very low, the specific resistance being 801 megohms.

Boron takes fire in the air at 700°, and burns in oxygen with a brilliant green flame having little actinic power; in either case the combustion is soon stopped by the formation of a layer of boric anhydride on the surface of the boron. It combines energetically with sulphur at 610° to form a sulphide which is decomposed by water with evolution of hydrogen sulphide; it behaves in the same way with selenium, but does not combine with tellurium.

Boron burns in dry chlorine at 410°, and in bromine vapor at 700°, with the formation of boron chloride and bromide. It is dissolved by bromine water, and more readily by a solution of bromine in potassium bromide solution, but it does not combine with iodine.

It combines with nitrogen at 1,230°, but not directly with phosphorus, arsenic or antimony. Neither does it combine directly with carbon or silicon, although a boron carbide is formed when boron is heated in the electric arc in an atmosphere of hydrogen.

The alkali metals have no action on boron, but magnesium combines with it at a red heat. Iron and aluminium form borides only at high temperatures, whilst silver and platinum combine with it quite readily.

Acids react energetically with boron; sulphuric acid is reduced at 250°; the action of nitric acid is so vigorous as to raise the temperature to incandescence; phosphoric anhydride is reduced to phosphorus at 800°; arsenious and arsenic acids are reduced to arsenic at a dull red heat; iodic acid in solution is reduced to iodine in the cold, and

---

[1] *Compt. rend.*, **114**, 617–622; *Jour. Chem. Soc.*, Octbr., 1892, p. 1153.

a mixture of the dry acid with boron becomes incandescent, and iodine is evolved; chloric acid is reduced to chlorous acid.

The hydracids react with greater difficulty. Hydrogen fluoride is not attacked until a dull red heat is reached, when boron fluoride is formed and hydrogen liberated. Hydrogen chloride is attacked only at a bright red heat, whilst its aqueous solution has no action whatever on boron.

Sulphurous anhydride is reduced to sulphur at an incipient red heat. Steam is not attacked until a full red heat is attained, but the action, once started, proceeds with great energy, boric acid being formed and hydrogen set free. Carbonic oxide is reduced to carbon at 1,200°. Silica is reduced to silicon when heated in a forge. Nitrous oxide is decomposed by boron at a dull red heat, boron nitride and boric acid being formed; nitric oxide is not affected by it.

Metallic oxides are more readily reduced by boron than by carbon. When, for instance, a mixture of boron and cupric oxide is heated in a glass tube, the reaction which ensues is so violent as to melt the glass. Stannous oxide, litharge, antimonious and bismuth oxides are all readily reduced. A mixture of boron and lead peroxide detonates violently when triturated in a mortar. Ferric and cobaltous oxides are reduced at a red heat, but the oxides of the alkaline earths are not affected. Hydrogen is liberated by boron from fused potassium hydroxide. A mixture of boron, sulphur, and nitre deflagrates at a dull read heat, whilst small quantities of boron projected into fused potassium chlorate burn with a most dazzling flame.

Boron acts very energetically on the metallic fluorides; it decomposes the fluorides of the alkalis and alkaline earths at a bright red heat; zinc fluoride at a dull red heat, boron fluoride being formed; and it acts with even explosive violence on lead and silver fluorides. Its action on the metallic chlorides is not so energetic. The chlorides of the alkalis, the alkaline earths, zinc and lead are not attacked at a red heat, but mercurous chloride is reduced to mercury at 700°. Lead, zinc, cadmium and copper iodides are not reduced by boron, but tin and bismuth iodides are reduced with facility. Potassium, sodium, calcium and barium sulphates are reduced by boron at a red heat to the corresponding sulphides.

Notwithstanding its great affinity for oxygen, boron may be immersed in fused potassium nitrate without any reaction occurring.

provided that the temperature is below that at which oxygen is disengaged. Fused potassium nitrite, however, is decomposed by it with great violence. Sodium carbonate is reduced at a dull red heat, potassium carbonate at a somewhat higher temperature, and calcium and barium carbonates not at all.

The arsenites, arsenates and chromates are all reduced at a dull red heat.

Boron behaves also as a reducing agent in the wet way. It reduces potassium permanganate solution, partially in the cold, entirely on heating. It reduces ferric chloride to ferrous chloride. It precipitates silver from silver nitrate solution in fine crystals, and reduces palladium, platinum and gold from solutions of the chlorides of these metals.

Boron thus combines with the non-metals much more readily than with the metals. It is a more powerful reducing agent than either silicon or carbon, and, on the whole, is most nearly allied to the latter element.

ACTION OF NITRIC ACID ON METALS.[1]

By C. Montemartini.

In the experiments described in this paper, the metals cadmium, iron, nickel and cobalt were respectively dissolved in nitric acid of various degrees of concentration, at least 20 times the amount of acid required for solution being used so as to exclude secondary reactions as far as possible.

The experiments were principally carried out at a temperature of 8°, and the results are given in a series of tables. From these it appears that the evolution of ammonia is not limited to dilute solutions of nitric acid; thus, for instance, 0·00139 gram of ammonia was formed per gram of cadmium dissolved in 47 per cent. nitric acid; 0·0051 gram of ammonia per gram of iron dissolved in 52 per cent. nitric acid; and 0·01839 gram of ammonia per gram of cobalt dissolved in 42·8 per cent. nitric acid.

The gases evolved by the dissolution of 1 gram of the following metals in excess of 27·5 per cent. nitric acid were as follows:

---

[1] *Gazzetta*, **22**, i, 250–265, and 277–343; *Jour. Chem. Soc.*, 1892, p. 1278.

	NH_3.	HNO_2.	N_2O.	N.	NO.	Total grams.
Cadmium, ...	0·00197	0·00695	0·00570	0·00033	0·00216	0·01691
Iron, ...	0·02493	0·00195	0·00422	0·00045	—	0·03553
Nickel, ...	0·01874	0·00060	0·00749	0·00071	—	0·02754
Cobalt, ...	0·02538	0·00077	0·00927	0·00467	—	0·04009

These numbers agree neither with the hypothesis that the dissolution of the metal is accompanied by the formation of nascent hydrogen, nor with that of the direct oxidation of the metal by the acid. No hydroxylamine is found amongst the final products of the reaction; this compound, if formed, must therefore be immediately destroyed by a secondary reaction. The nitric oxide is always of secondary origin, being derived in the case of cadmium, nickel and cobalt from the decomposition of nitrous acid, and in the case of iron partly from the same source and partly from the oxidation of the ferrous salts first formed. The author holds that nitric acid acts as an oxidizing agent in conjunction with the water present, the latter entering into the reaction.

The investigations were also extended to *zinc*. The products formed in the reaction at a low temperature when the acid is in large excess are nitrous acid, hyponitrous acid, nitric oxide, nitric peroxide, nitrous oxide, nitrogen and ammonia. Under the conditions mentioned, hydroxylamine is not found among the final products of the reaction, and free hydrogen is never evolved. With the exception of nitrous acid and nitric peroxide, the above products are formed, whatever the degree of concentration of the acid; no nitrous acid is, however, formed if the solution contains more than 30 per cent. of nitric acid, and no nitric peroxide if it contains less.

Ammonia.—At a temperature of 3–8°, the quantity in solution rises rapidly until the concentration of the acid is 10 per cent., then slowly until a maximum is attained between 40 and 45 per cent.; it falls abruptly at 47 per cent., and at 53 per cent. only a very small quantity is producted, which gradually diminishes with increased concentration, and may be represented by a straight line passing through the zero point at 100 per cent. At a temperature of 85°, the maximum occurs at a concentration of 9 per cent., when it is equal to the production at the lower temperature; it then falls

rapidly as the concentration is increased to 15 per cent.; beyond this point it may be represented by a line passing through the zero point when the concentration is 100 per cent.

Nitrous Acid.—At a temperature of 18–21°, the production increases rapidly with the temperature until a concentration of 14 per cent. of nitric acid is attained; it then falls with equal rapidity with increase of concentration to 30 per cent., at which stage nitrous acid ceases to appear among the final products.

Nitric Peroxide.—Between 18° and 22°, nitric peroxide is first formed at a concentration of 27 per cent. of acid; it increases slowly at first, rapidly between 64 per cent. and 72 per cent.; beyond 80 per cent. it remains almost constant.

Nitrous Oxide.—The formation of this compound takes place in comparatively large quantities and with great regularity. It reaches a maximum at a concentration of 40 per cent. acid and a minimum at 80 per cent.

Nitrogen is only formed in very small quantities in acid of all degrees of concentration.

The *velocity* of the dissolution of the zinc in nitric acid increases regularly with the concentration of the acid below 25 per cent.; it then falls slightly, remains constant between 33 per cent. and 42 per cent., then diminishes regularly, attaining its minimum value at a concentration of 68 per cent.; a considerable rise then takes place with increased concentration, but the previous maximum value is not again attained.

In conclusion, the author points out that the hypotheses that the reduction of nitric acid is effected by the direct action of zinc or by nascent hydrogen, both fail in certain cases, as a larger quantity of reduction products is formed than would be theoretically possible, and suggests that the water present enters into the reaction.[1]

SESQUITERPENES.[2]

While the characteristics of the terpenes are now tolerably well known, so that the recognition of the various isomers is no longer very difficult, and the knowledge of the mutual relations, as well as

[1] The author, in referring to previous researches, makes no mention of those of Veley on the action of nitric acid on metals.—EDITORS Jour. Chem. Soc.

[2] Abstract of a memoir by O. Wallach and W. Walker, in *Annalen*, September 17; reprinted from *Phar. Jour. and Trans.*, Novbr. 12, 1892.

the constitution of the hydrocarbons, $C_{10}H_{16}$, is in a fair way to be extended, the hydrocarbons $C_{15}H_{24}$ are still enveloped in obscurity. These bodies are thick liquids, easily resinified, and boiling between 250° and 280° C. The number of isomers is undoubtedly great, but hitherto only one of the series has been definitely identified.[1]

In the investigation of the $C_{15}H_{24}$ compounds the same methods have to be adopted as in the study of the terpenes.[2]

Several substances are described as having the formula $C_{15}H_{26}O$, which may be regarded as hydrates of the hydrocarbons $C_{15}H_{24}$; for instance, cubeb camphor and patchouli camphor. It is known that the latter is convertible by dehydrating agents into $C_{15}H_{24}$, but this product has not been further investigated and no attempt has been made to hydrate a $C_{15}H_{24}$ body, so as to obtain artificially a body corresponding to the hydrate occurring naturally.

In operating upon patchouli camphor it was easily ascertained that under the same conditions that turpineol $C_{10}H_{18}O$ is converted into $C_{10}H_{16}$, such as boiling with dilute acids, patchouli camphor may be converted into $C_{15}H_{24}$. The reproduction of the crystalline hydrate from the hydrocarbon could not be effected.

To obtain further knowledge of the capacity of sesquiterpenes to become hydrated, the sesquiterpene of clove oil was tried and found to be readily convertible into a crystalline hydrate, quite different from patchouli camphor. Caryophyllene, the sesquiterpene of clove oil distils over between 250° and 260°, and its hydration was effected by adding 25 grammes to a mixture of 1000 grammes glacial acetic acid, 20 grammes concentrated sulphuric acid, and 40 grammes water, heating the whole for twenty-four hours on a water-bath. The dark-colored liquid was then distilled in a current of steam. A thin oil, of ethereal odor, was thus obtained, which separated on addition of water to the first part of the distillate. Subsequently, a less volatile oil was obtained, which solidified on cooling. After separating the oily portion by cooling and absorption, this crystalline substance was purified by redistillation and crystallization from alcohol. It proved on analysis to be the hydrate of caryophyllene, $C_{15}H_{25}.OH$, boiling at 287° to 289°, and melting at 94° to 95°. It is almost insoluble in water, slightly soluble in hot water, readily

[1] *Annalen*, 238, 78; 252, 150.

[2] *Berichte*, 24, 1526.

soluble in ether, alcohol, and most other solvents. In the solid state it is almost without smell, but the vapor has the odor of pine needles. The chemical characters of this substance prove it to be an alcohol. The chloride, bromide, iodide and nitrite were prepared; they are crystallizable substances, optically inactive and very stable. The iodide subjected to the action of sodium yielded a crystallizable hydrocarbon, melting at 135° C., which gave, on analysis, results pointing to the formula $C_{30}H_{50}$, and at least showing that the treatment had given rise to the production of a hydrocarbon of high molecular weight, closely related to the terpene group.

Dehydrating agents convert the alcohol into a liquid hydrocarbon, clovene, boiling between 261° and 263°; its specific gravity was 0·930 at 18° C. Its composition is represented by the formula $C_{15}H_{24}$, but as it could not be reconverted into the alcohol it was evidently distinct from caryophyllene.

Out of a large number of oils containing sesquiterpenes only one was found to yield material from which the above described alcohol could be obtained in the same manner. The fraction of copaiba oil, distilling between 250° and 270°, gave the desired result, and the crystalline alcohol prepared from it proved to be identical with that from clove oil. The identity of this hydrocarbon with that in clove oil was also proved by the production of a nitroso chloride $C_{15}H_{24}NOCl$, a white sparingly soluble powder that blackened and decomposed at 161–163°, and was readily converted by reaction with piperidine into a nitrolamine.

The terpenes, $C_{10}H_{16}$, are known to be susceptible of reduction to hydrocarbons of the formula $C_{10}H_{20}$,[1] and by operating upon the dihydrochloride, $C_{15}H_{24}2HCl$, with hydriodic acid, a hydrocarbon of the composition $C_{15}H_{28}$ was obtained, the characters of which, as compared with those of the original sesquiterpene, are as follows:

	$C_{15}H_{24}$	$C_{15}H_{27}$
Specific gravity, ...	·918	·872
Boiling point, ...	274–275°	257–260°

The sesquiterpenes may be classed in two groups, those with one ethylene bond and those with two. The best known representative of the latter is the frequently occurring lævorotatory sesquiterpene, which forms with two molecules of hydrochloric acid a well-defined

[1] Berthelot, *Jahresb.*, 1869, 333.

crystallizable compound. This hydrocarbon exists in cubeb oil,[1] savin oil,[2] cade oil,[3] betel oil,[4] camphor oil,[5] galbanum oil,[6] patchouli oil,[7] juniper oil,[8] asafœtida, coto oil,[9] and olibanum oil. It appears to be as widely distributed as limonene. Of the numerous names which might be given to it on account of its varied occurrence, that of cadinene is suggested by Wallach as the most convenient, because the oil of cade, juniper tar oil, is the most accessible and the cheapest source of the substance.[10]

Caryophyllene is essentially different from cadinene. Its physical constants have not been determined precisely, but it certainly boils at a somewhat lower point than cadinene. With halogen acids it forms only liquid addition products. By addition of 1 molecule of water it yields a saturated alcohol $C_{15}H_{26}O$. But it must be remembered that in conversion into the alcohol caryophyllene appears to be isomerized. Well-defined crystalline halogen compounds can be obtained from the alcohol, containing only one atom of halogen and presenting the characters of fully saturated stable compounds. But hitherto it has not been possible to obtain these halogen compounds directly from caryophyllene.

By separation of water from the alcohol a different sesquiterpene, clovene, is obtained. This differs essentially from caryophyllene, since it is not convertible into the alcohol $C_{15}H_{26}O$ by warming with dilute sulphuric acid, and since it apparently does not form a crystallizable nitroso chloride. The boiling point of clovene is lower (261–263°) and the specific gravity higher (0·930) than that of cadinene. Apparently clovene has only one ethylene bond in its molecule. This cannot be affirmed of caryophyllene until its physical constants have been determined with greater certainty.

The hydrocarbon isomeric with caryophyllene, which is generally associated with cadinene in ethereal oils and differs from cadinene

---

[1] *Annalen*, 238, 78.
[2] *Ibid.*, 238, 82.
[3] *Ibid.*, 238, 82.
[4] *Jour. p. Chem.*, 39, 355.
[5] *Jour. p. Chem.*, 39, 355; and *Annalen*, 114, 193.
[6] *Annalen*, 238, 81.
[7] *Ibid.*, 238, 81.
[8] Schimmel's *Berichte*, April, 1890.
[9] *Arch. f. Pharm.*, 229, 17.
[10] *Annalen*, 252, 150.

in not forming crystalline addition compounds with halogen acids, is certainly different from caryophyllene. It remains to be seen whether this frequently occurring hydrocarbon is related to clovene. The product obtained by dehydration of patchouli camphor, or, more correctly, patchouli alcohol, may be regarded as a distinct sesquiterpene. From its peculiar cedar smell, differing altogether from the previously described hydrocarbons, there is some reason to suspect relation to cedrene, which occurs so abundantly in cedar oil, but the determination of this question must be left for future inquiry.

For the identification of sesquiterpenes the most useful compounds will be the hydrates, which may be regarded as the alcohols of the sesquiterpene series, standing in the same relation to the hydrocarbons as terpineol does to dipentene. These hydrates, hitherto designated by the inappropriate generic name of "*camphors*," will form the subject of further investigation in the laboratory of the Chemical Institute of the University of Göttingen. The experimental part of the investigation, described in the foregoing abstract, was carried out by Mr. W. Walker, of Pittsburg, in conjunction with Professor Wallach.

NOTE ON ETHER AS A MENSTRUUM IN MEDICATION BY THE SKIN.[1]

By Sir James Sawyer, M.D., Lond., F.R.C.P
Consulting Physician to the Queen's Hospital, Birmingham.

May I especially invite the attention of pharmacists to the advantages of ether as a menstruum, for the preparation of remedies which are designed to act through the skin? Confirmed and extended as my views have been by experience in practice, I venture to think the proposals I made to the medical profession, two years ago, concerning this use of ether, indicate a practical advance in our remedial resources which promises further useful application, both in human and in comparative therapeutics.[2] Not every officinal compound "for outward application only" can be accredited with percutaneous energy. Until ethereal tinctures and liniments were used, we were accustomed in medical practice to present many

[1] From the Pharmaceutical Journal and Transactions, Oct. 15, 1892, p. 301.

[2] See the *Lancet*, May 17 and June 20, 1890, and my "Contributions to Practical Medicine," of the same year.

remedies and many different preparations to the skin, with the view of producing remote or local effects, or both, in the form of compounds very ill designed for their special purpose. The officinal formulæ of outward applications include emplastra, various liniments, of alcoholic, saponaceous, or oleaginous composition, and certain fatty unguents. Of these medicaments for enepidermic use the oily liniments and the ointments, because of their easy admixture with the sebaceous secretion of the human skin, are probably the most active. I am afraid the structure of none of the fourteen plasters of the British Pharmacopœia is such as to permit the absorption of its active ingredients by the skin. The body of an officinal plaster is made of litharge in union with oleic, margaric and stearic acids, or of wax, of lard, of frankincense, of resin, of soap, of suet, and of some fixed oils, in various combinations. "Neither a plaster so formed," as I wrote in one of my former papers upon this subject, "nor a solution in alcohol of the active principles of drugs is a scientific medicament for enepidermic employment and percutaneous action, if we have regard to the structure and physiology of the human skin." In practice it is found that there are at least three separate obstacles to the absorption of a medicine through the skin, namely, the fatty sebaceous secretion of the skin, the epidermis, and insolubility of the drug. So far as I know, ether is the best menstruum for the solution of many remedies for local use through the skin. It is a good solvent of the active principles of many drugs, and it is a ready solvent of the fatty constituents of the sebaceous secretion of the skin. An ethereal liniment supplies the most intimate application of a remedy to the bare dermal surface. Dr. Lauder Brunton has written: "It would appear that the fat of the skin, as well as the epidermis, presents an obstacle to the absorption of substances in solution; but when they are applied in such a form that they can readily mix with the sebaceous matter of the skin, they are tolerably readily absorbed; as, for example, when they are used in the form of ointment. * * * They are absorbed also when dissolved in ether, and especially in chloroform, even when simply painted over the surface. Alcoholic solutions are not absorbed when painted in this way." Chloroform has many disadvantages, but ether is an excellent agent, for use either as a menstruum, in tinctures for external employment, or as a simple solvent, for the preparation of a liniment.

I have proposed and used several ethereal tinctures for dermal employment; namely, of belladonna (tinct. bellad. ætherea), of capsicum, of iodine and of menthol. I expect physicians and pharmacists will find other useful developments of ethereal preparations as remedies applied to the skin.

COLORING MATTERS OF THE VINE: AMPELOCHROIC ACIDS.[1]

By A. Gautier.

The rapidity with which grapes ripen in Mid Europe led the author to suppose that the skin pigment to which the color is due is formed by the oxidation of aldehydic or catecholic substances, originating in the leaves and travelling thence to the fruit. This view was borne out by the effects following the removal of the leaves from grapes about to ripen, or by the partial or complete stoppage of the circulation between the leaves and stem, the grapes in the first case remaining in a state of arrested development, whilst in the second the leaves changed in color to red or brown, and not the grapes.

The coloring matter of leaves thus reddened (from plants of the Carignan stock) was extracted with tepid water and purified by fractional precipitation with lead acetate, with which it finally formed an olive-green precipitate; this, on decomposition with hydrogen sulphide and purifcation, yielded a mixture of two colored crystalline acids, α- and β-ampelochroic acids. These were separated by means of cold water, in which the latter alone is soluble.

α-Ampelochroic acid, $C_{19}H_{16}O_{10}$, is bibasic and forms a cochineal-colored powder consisting of ruby-red plates or spindles, soluble in boiling water or cold alcohol, but insoluble in ether. Its solutions are feebly acid to litmus. The *zinc* salt is olive-green, and turns indigo-blue on heating, the *acid zinc* salt is rose-colored and soluble; the *lead* salt is dark green, and blackens at 50°; the *acid lead* salt is wine red. Solutions of α-ampelochroic acid are turned greenish-brown by alkalis, and oxidize on exposure to the air; they are precipitated by bromine-water; they give a greenish-black precipitate with ferric salts, a dark-brown precipitate with mercuric nitrate, a yellowish-gray precipitate with silver nitrate, especially in presence of

[1] *Compt. rend.*, **114**, 623-629; Jour. Chem. Soc., October, 1892, p. 1242.

ammonia, a rose colored precipitate with gelatin solution, and a chestnut-brown precipitate with cinchonine acetate. The acid therefore belongs to the classes of tannins and polyphenolic substances.

β-Ampelochroic acid, which is stated to have the composition $C_{26}H_{24}O_{15}$, bears a general resemblance to the *α*-acid. It forms cochineal-colored crystals, and its aqueous solution is feebly acid to litmus and feebly astringent to the taste. It is precipitated by gelatin and by cinchonine acetate; it gives a violet precipitate with tartar emetic, a dark-green precipitate with zinc acetate, a dirty, rose-colored precipitate with mercuric nitrate, a yellowish-brown precipitate with copper acetate, and a chestnut-brown precipitate with hot silver nitrate. Potash turns the color of its solution to yellowish-green, and ferric chloride gives a dark violet coloration, changing to a brown precipitate.

A third acid of the same general character as the others was obtained from the first fraction or blue precipitate formed in their preparation. The precipitate was suspended in water, decomposed with hydrogen sulphide, partially saturated with baryta water, and the whole evaporated to dryness in a vacuum. The residue was extracted with ether to remove impurities, and the new acid was dissolved out with alcohol.

γ-Ampelochroic acid, $C_{17}H_{18}O_{10}$, crystallizes in reddish-brown octahedra and dissolves readily in water to a red solution, astringent to the taste. With gelatin and tartar emetic, it forms rose-colored precipitates which dissolve on heating; with mercuric nitrate, it gives a pale, greenish-blue precipitate, a green precipitate with calcium acetate, an olive-green precipitate with basic lead acetate, a dark violet to brown precipitate with ferric salts, and an orange to yellow precipitate with bromine water. Potash changes the color of its solutions to olive-green.

DETECTION OF HIGHER ALCOHOLS IN SPIRITS OF WINE.[1]

By C. Bardy.

A preliminary examination is made by agitating 10 cc. of the alcohol with cc. of a saturated salt solution. If an oily upper layer does not separate, 100 cc. of the alcohol is agitated with 450 cc. of a saturated salt solution in a vessel provided with a stop-cock; suffi-

[1] *Compt. rend.*, **114**, 1201–1204; *Jour. Chem. Soc.*, Novb., 1892, p. 1379.

cient water is added to redissolve the salt that is precipitated, and then 60 to 70 cc. of carbon bisulphide, and the mixture is well agitated. After a short time, the bisulphide is transferred to a smaller similar vessel, and the extraction is repeated a second and third time with similar quantities of carbon bisulphide, the whole of the latter being transferred to the second vessel. In order to separate the alcohols from the bisulphide, the latter is mixed with sufficient concentrated sulphuric acid (about 2 cc.) to form a heavier layer at the bottom of the vessel, and, after vigorous agitation, the acid is transferred to a smaller vessel. The extraction is repeated several times with 1 cc. of acid each time, and the various quantities of acid are mixed, heated at 50–60°, and a current of air passed over the surface of the liquid until all the bisulphide is expelled. An equal volume of glacial acetic acid is then added, and the mixture heated on a water-bath at about 100° for a quarter of an hour, the flask being fitted with a reflux condenser. When the action is complete, the contents of the flask are poured into 100 cc. of saturated salt solution If higher alcohols were originally present, the corresponding acetates separate and form an upper layer, the volume of which can be measured by any of the usual methods, the liquid being previously cooled to 15°. The number of cubic centimetres of acetates multiplied by 0·8 gives the percentage of higher alcohols in the alcohol examined.

If in the preliminary test an oily upper layer separates, only 25 cc. of the alcohol should be taken and mixed with 100 cc of saturated salt solution and 8 to 10 cc. of water. The quantity of carbon bisulphide, however, ought not to be reduced, and all the other operations are conducted in the manner described.

The carbon bisulphide dissolves only butyl and amyl alcohols, and if propyl alcohol is sought for, the salt solution that has been extracted with bisulphide is filtered and distilled until an alcoholometer in the receiver marks 50°. The quantity of propyl alcohol in the distillate is estimated by titration with permanganate (Barbet) or by Gossart's method.

Alcohol in the distillery residues known as "essential oils" may be determined by a modification of this method. 500 cc. is agitated with an equal volume of salt solution, and the latter is extracted with three successive quantities of carbon bisulphide and afterwards distilled. The alcoholic strength of the distillate, corrected, if neces-

sary, for the presence of propyl alcohol and calculated to the original volume, gives the percentage of alcohol present.

This method will detect 0·5 per cent. of higher alcohols in spirits of wine. Greater sensitiveness can be obtained by working with a larger quantity of the alcohol, but in this case a correction must be made on account of the ethyl acetate formed from the alcohol dissolved by the carbon bisulphide.

KOUMISS.[1]

By D. H. Davies.

Papers upon this subject have from time to time appeared in the Journal, but it is curious to note how careful most of the authors have been to evade giving detailed particulars regarding the difficulties that have to be surmounted in the manufacture of aërated milk preparations.

The original Koumiss is the Russian, made from mare's milk, which is used for the obvious reason that it is less rich in casein and fatty matter than cow's milk, and therefore far more easy of digestion.

Mare's milk contains approximately 1·70 per cent. of casein, and 1·40 per cent. of fatty matter, whereas cow's milk contains 4·55 of casein and 3·70 of fatty matter.

I think I am correct in stating that cow's milk is universally used in this country, and it answers the purpose admirably in most instances, but a better preparation is obtained by diluting with water to reduce the percentage of casein, etc.

Mare's milk contains 8·75 of milk sugar, cow's milk only 5·35; it is therefore necessary to add some of this to our preparation. The following formula answers very well. Take of—

Fresh milk,	12 oz.
Water,	4 oz.
Brown sugar,	℥iiss.
Compressed yeast,	gr. xxiv.
Milk sugar,	℥iij.

Dissolve the milk sugar in the water, add to the milk, rub the yeast and brown sugar down in a mortar with a little of the mixture, then strain into the other portion. Strong bottles are very essen-

[1] From the Pharmaceutical Journal and Transactions, Oct. 15, 1892, p. 301.

tial, champagne bottles being frequently used, and the corks should fit very tightly; in fact, it is almost necessary to use a bottling machine for the purpose, and once the cork is properly fixed it should be wired down. Many failures have resulted because the corks did not fit properly, the result being that the carbonic acid gas escaped as formed and left a worthless preparation. It is further necessary to keep the preparation at a moderate temperature, and to ensure the article being properly finished the bottles are to be gently shaken each day for about ten minutes to prevent the clotting of the casein. It is as well to take the precaution of rolling a cloth round the bottle during the shaking process, as the amount of gas generated is great, and should the bottle be of thin glass or contain a flaw it may give way. Some few days elapse before the fermentation passes into the acid stage, and when this has taken place the preparation is much thicker. It is now in the proper condition for allaying sickness, being retained by the stomach when almost everything else is rejected.

Malted Koumiss can be made as follows:

Extract of malt,	℥iss.
Compressed yeast,	gr. xx.
Brown sugar,	gr. x.
Milk, to champagne pint.	

Euonymized Koumiss is a suitable preparation for use in some cases of derangement of the liver in which food is rejected and an hepatic stimulant is required, combined with a slight sedative. To prepare this add fluid extract of euonymus, ʒiij, to every 16 ounces of the diluted milk, then proceed as with ordinary koumiss.

Coca Koumiss could be made by the addition of cocaine hydrochlor. to the milk, and would be specially adaptable in cancer of the stomach.

Aërated whey, which is a very refreshing drink in cases of fever and much used in some parts of Germany, could also be manufactured on the same principle as koumiss.

Peptonized Koumiss.—The easiest way of getting a satisfactory preparation is by the adoption of the following formula:

Papaine,	gr. vi.
Milk, to champagne pint.	
Compressed yeast,	gr. xx.
Brown sugar,	ʒiij.

This does not keep very long.

Meat and Malt Koumiss would constitute a serviceable preparation in consumption.

Chemists dealing in these preparations should impress upon the minds of their customers, the necessity of keeping the bottles in a cool place, and the advisability of using either champagne or soda water taps, so that the bulk of the gas may not escape with the first draught.

THE ARROWROOT PLANTATIONS OF COOMERA AND PIMPAMA, QUEENSLAND.[1]

By H. L. Thompson.

The arrowroot grown in the township of Coomera is the purple variety—the *Canna edulis*. It sometimes grows to a height of eight feet, bears a pretty scarlet flower, and a dark purple seed pod follows, which is generally sterile. The best variety of arrowroot, the *Maranta arundinacea*, which is grown so extensively in the Bermudas, thrives well in this district; but its cultivation has been almost abandoned, owing to the difficulty of manufacture. This kind attains the height of two feet, and bears, at maturity, a small white flower somewhat resembling the potato blossom. In the districts of Coomera and Pimpama there are from 250 to 300 acres under cultivation.

The mode of cultivation is as follows: The ground is ploughed in ridges of about forty-six feet wide, and thoroughly harrowed and scarrified. Nine rows are placed in this, five feet apart, leaving six for the row in which the by-furrow comes. Shallow furrows, five inches deep, are run with the plough, then the smaller bulbs, about the size of a small apple, which are found growing at the bottom of the stems, are placed four feet six inches apart in the drill, and covered by turning a furrow from each side on to the top of the bulbs. Afterwards, cultivation is carried on by keeping the ground clear of weeds by means of horse-hoes or scufflers. When the plant reaches the height of about three feet, the space between the rows is turned up with a one-horse plough, the soil thrown towards the plant, and a furrow left in the middle. It requires nothing further till it is dug up for the mill. When the tubers have come to maturity, which is generally in ten months or a year, the crop is ready. The stalks of the plant are then cut off as close as possible

[1] From the *Pharmaceutical Journal of Australasia*, August, 1892, p. 87.

to the tubers with a cane knife or strong reaping hook. The tubers are then raised with grubbing hoe or mattock. With all speed they are placed in carts and conveyed to the mill, for the color is seriously affected by being exposed to the sun or weather before grinding. Sometimes as much as 50 lbs. of tubers are obtained from one plant.

The machinery consists of a six-horse power engine, a root-washer, grinding mill, cylinder, sieves for separating the farina from the fibre and pulp, and a centrifugal for drying. The root-washer is a trough ten feet long, three feet deep, and two feet in diameter. This has a half circular bottom, through which a stream of water is constantly running. A spindle having pegs about four inches apart, and of a sufficient length to reach within an inch of the bottom and sides, revolves in the trough. The pegs cleanse the bulbs of all dirt and they gradually work down to one end of the trough. A wooden rake pushes the bulbs out into a continuous belt elevator, and thence they are conveyed to the hopper of the mill. This is a wooden drum two feet six inches on the face, and two feet in diameter. It is covered with a sheet of galvanized iron, punched and placed on with the burr on the outside. The drum revolves at great speed, and a stream of water falls on it from tanks fixed above. Thus the bulbs are grated up, the bulbs and the water passing through the sieve No. 1, which is a cylinder eight feet long with the bottom half perforated with holes about the size of a No. 7 wire nail. Within this a beater revolves, forcing the water and farina through the holes, and being placed on the screw the pulp and fibre are forced out at the end. The farina and water pass into sieve No. 2, which is similar to No. 1, only with holes about the size of a large pin-head in the bottom of copper. After this the liquid runs along a trough two feet wide, six inches deep, and seventy feet long. The farina is deposited at the bottom of this, and the water passes off. The farina is now dug out, and passed through sundry more sieves, washed by hand and in tubs, then finally left to subside. When pretty firm it is taken out and passed through a centrifugal machine. It is now placed on the drying frames. These are wooden frames about six feet six inches long, with marsupial netting and calico stretched upon them. They are placed away from any dust or smoke, and the wind passing underneath, as well as the sun above, aids in the drying process. But the sun and air are not alone

trusted with the drying. A drying house has been erected, capable of accommodating 180 frames. This is heated by steam pipes to 140° F. The value and market price of arrowroot depends so much on the color and quality, that the greatest care is necessary throughout its manufacture, and only very clear water is used in the washing.

SOLUTIONS OF MEDICINAL RESINS.[1]

By HAROLD WYATT, JUNR.

Early in the year my interest was excited by a question asked at one of the meetings of the Liverpool Pharmaceutical Students' Society as to the best method of making a solution of jalap resin in glycerin for use as a rectal injection. The usual mode of dealing with similar bodies, by dissolving them in alcohol and making the resulting solution into an emulsion, could not be followed, owing to the manner in which the preparation was to be administered and as jalapin is practically insoluble in glycerin, a simple solution was out of the question. On using the sapo jalapæ of the German Pharmacopœia—made by dissolving 4 parts each of Castile soap and jalap resin in 8 parts of alcohol and evaporating to 9 parts—not more than an equivalent of 2 grains of jalap resin could be got into a fluid drachm of glycerin without increasing the viscosity of the liquid to such an extent that it did not run easily from the syringe. Bearing in mind a paper on the use of resin soap as an emulsifying agent, read by Mr. Collier, of Guy's Hospital, at an evening meeting of the Pharmaceutical Society, in March, 1890, it struck me that, as most resins dissolve in alkaline solutions, forming soaps, jalap resin would, when similarly operated on, behave in like manner and moreover the soap formed would act as an emulsifier to any of the constituents of the resin not saponifiable. Reference to "Pharmacographia" eliciting the fact that jalap resin was soluble in alkaline solutions I put the idea into practice, but had to abandon the use of potassic or sodic hydrate for the purpose, in consequence of the difficulty there was in obtaining a neutral soap solution. Finally, by using solution of ammonia as the saponifying agent, and evaporating the resulting liquid after the addition

[1] Read before the Liverpool Pharmaceutical Students' Society; reprinted from the Chemist and Druggist, Octbr. 29, 1892.

of a little glycerin, I obtained a solution which was quite neutral, containing 6 grains of jalapin to the fluid drachm and capable of dilution with water in any proportion without precipitation of the resin. The manner of working was as follows:

Three hundred and eighty-four grains of jalapin (insoluble in ether) were mixed with 3 oz. of strong solution of ammonia and allowed to stand, with occasional shaking, for two days. The resulting solution was placed in a water-bath, 2 oz. of glycerin were added, and the whole evaporated, with constant stirring, until ammoniacal fumes were no longer given off, the liquid being made up when cold to 8 fluid oz. with glycerin. On trial in the Liverpool Royal Infirmary this preparation was found to be both active and reliable. Subsequently I made in a similar way a series of solutions containing respectively resin of scammony, podophyllin and aloin, all of which turned out satisfactorily. Guaiacum resin gave a solution which deposited a good deal on standing; the supernatant liquid, doubtless ammonium guaiacate, was found useful as an addition to gargles and gelatin throat pastilles. In publishing this note I wish to draw attention to a method which I believe is capable of extended application in making liquid preparations of drugs which owe their activity wholly or in part to resins or resinoid bodies—such, for instance, as cascara sagrada and podophyllum.

THYROID EXTRACT: ITS PREPARATION FOR THE TREATMENT OF MYXŒDEMA.[1]

By EDMUND WHITE, B.Sc., LOND. F.I.C., Pharmaceutist to St. Thomas' Hospital.

The hypodermic injection of a glycerin extract of the thyroid gland of the sheep has been advocated as a remedy for myxœdema (see *British Medical Journal*, October 10, 1891, and April 16, 1892). In St. Thomas' Hospital an extract, prepared by the method given below, has been used with satisfactory results.

To obtain the glands, it is best to go to the slaughter house when sheep are being killed. Take a scalpel, pair of forceps, and a stoppered bottle, all of which must be thoroughly cleansed and rinsed with 5 per cent. aqueous solution of carbolic acid. As soon as the sheep is dead, have the skin removed from the neck, and, with the animal lying on its back, make a median incision, extending from

[1] From the Pharmaceutical Journal and Transactions, Octbr. 22, 1892, p. 321.

beneath the chin nearly to the breast, so as to expose the trachea. The thyroid consists of two lobes, situated in the upper part of the neck, one on each side of the trachea, and connected by a narrow bridge or isthmus. This isthmus is about one-eighth of an inch broad, and is seen running across the trachea just below the larynx, on about the third or fourth cartilage ring. It is reddish in color, but sometimes very pale. Tracing it round on either side of the trachea, the two lobes are easily found. Each lobe is from 1–1½ inch long, about ¾ inch broad, shaped like an almond, and of firm and compact texture. The color is dark red. Remove the lobes by means of the forceps and scalpel, as free as possible from the surrounding connective tissue, and transfer them at once to the bottle.

To prepare the extract, cut up the glands into transverse slices on a clean glass or earthenware plate which has been rinsed in 5 per cent. carbolic acid solution. All the utensils employed in the subsequent operations must be rinsed in the same fluid. Place the sliced glands in a mortar with some ordinary glass tubing—about two inches to each pair of glands will be found sufficient. Grind the whole up together until the glands are thoroughly disintegrated, then add a mixture of equal parts of glycerin and water in the proportion of one fluid drachm to each pair of glands. The mixture of glycerin and water must be first sterilized by boiling for a few minutes, and then cooled. After well triturating, transfer the contents of the mortar to a stoppered bottle or jar, add a small piece of thymol, and macerate for twenty-four hours. At the expiration of this period, squeeze out the fluid through a piece of muslin, by means of the fingers (previously dipped into 5 per cent. carbolic acid solution), and filter through a double layer of paper under pressure. The paper may be sterilized by immersion in boiling water. Under a pressure equal to about 15 inches of mercury a nearly clear filtrate of a pale red color is obtained, measuring about the same volume as the fluid added to the glands, since the glands themselves exude fluid when pounded in the mortar, and by filtering under pressure very little fluid is lost in the residue remaining on the filter.

If access cannot be had to a pressure filter, one must be content with pouring off the supernatant fluid after the twenty-four hours maceration, because filtration under ordinary conditions proceeds too

slowly. In this case much less extract is obtained, but this defect can be partly remedied by using double the quantity of glycerin and water given above. This will give a distinct layer of fluid which can be easily decanted from the residue. Care must be taken to see that it is free from solid particles of all but the minutest size. Fifteen minims of the stronger or thirty minims of the weaker extract is the quantity employed for each injection. The extract may be kept about seven days in a well stoppered bottle containing a piece of thymol. After this time its injection is followed by some local disturbance, due probably to incipient putrefactive decomposition, which the thymol seems incapable of preventing. Whether the addition of any other antiseptic, of harmless nature, would obviate this effect, has not yet been determined.

MICROSCOPICAL EXAMINATION OF PURE AND UNADULTERATED BUTTERS.[1]

By Jean Ferdinand.

In a paper, read before the Société Française d' Hygiène, the author points out that under the microscope a pure butter shows round, regular, fat cells. If this pure butter has not been carefully prepared, we note, in addition, granular masses of casein and albuminous matters, together with occasionally (especially as this butter does not keep well) the spores or filaments of penicillium. Margarine (animal fat), on the other hand, shows under the microscope crystals, separate or in groups. These crystals are very characteristic, and are seen to much better advantage if examined with polarized light, in which case the crystals show up brilliantly, whilst the ordinary fat cells are dark or black. By using a selenite plate in addition, the effect is still more remarkable—the crystals showing up of different brilliant colors (principally orange and red) upon a blue ground work. Pure butter, melted down and allowed to cool, if examined with a selenite plate and polarized light, shows largish cells, each cell divided into four segments by a black cross. Two of the segments are greenish and two are orange-yellow, whilst the groundwork is violet-blue. We have thus an extremely simple and trustworthy method for the examination of butters with a view to finding

[1] *Journal d'Hygiène*, August; the Medical Chronicle, October 1892, p. 43.

out those adulterated with fats (animal), but it must be remembered that the method is open to errors. Thus, a small amount of melted pure butter may give the characteristics of adulteration. So, too, pure butters that have become rancid. Vegetable fats, again, do not crystallize out like animal fats. Finally, certain butters of *very* inferior quality may give the appearances of adulterated butters; but, notwithstanding all this, the method is a very useful and simple one for deciding *at once* between butters that are manifestly pure, and those which are impure, and may require further examination by means generally adopted by analysts.

ACONITINE.[1]

By A. Ehrenberg and C. Kurfuerst.

The aconitine was purified from a large commercial sample by recrystallization from ether, only the middle fraction being used. The pure alkaloid melts at 193–194° (Dunstan and Ince, 1891, m. p. 181·5°), but the presence of a very small quantity of a decomposition product, which coats the crystals like a varnish and therefore escapes detection, lowers the melting point by 10° and more; for this reason the purification of aconitine by converting it into a salt and decomposing this by an alkali is inadmissible. The authors' formula for aconitine is $C_{32}H_{43}NO_{11}$; Wright and Luff give $C_{33}H_{43}NO_{12}$ (1878); Dunstan and Umney, $C_{33}H_{45}NO_{12}$ (1892). Determinations of methoxyl by Zeisel's method showed 9·92, 9·98 and 10·13 per cent. of methyl as methoxyl; the elimination of four methyl groups from the above formula would give 9·93 per cent.

When hydrolized by alcoholic potash, or by water, at 140–150°, aconitine yields a new base, methyl alcohol, benzoic acid and another acid (compare authors quoted). When it is heated with water in a reflux apparatus until it has all dissolved, picroaconitine and napelline are produced, and crystallize from the solution as benzoates; they may be approximately separated by treatment with dilute sulphuric acid, washing with ether to extract the liberated benzoic acid, adding sodium carbonate until there is a slight precipitate and again shaking with ether, which extracts the napelline; the picroaconitine is obtained by digesting the slightly alkaline solid residue with

[1] *J. pr. Chem.* [2], **45**, 604–613; *Jour. Chem. Soc.*, 1892, 1254.

ether. The picroaconitine, $C_{25}H_{39}NO_{11}$,[1] is probably formed from 1 mol. of aconitine by the absorption of 1 mol. of water and elimination of 1 mol. of benzoic acid, and the napelline, $C_{24}H_{37}NO_{10}$, from 1 mol. of picroaconitine, by the absorption of 1 mol. of water and elimination of 1 mol. of methyl alcohol. The mother liquors from the picroacontine and napelline benzoates contain aconine, $C_{22}H_{35}NO_9$, and acetic acid; this points to the formation of 1 mol. of aconine from 1 mol. of napelline by the absorption of 1 mol. of water and elimination of 1 mol. of acetic acid.

When aconine is distilled with barium hydroxide, paraffin hydrocarbons, methylamine, and an oily compound which boils at about 245° and has an odor of quinoline are obtained. This matter is being further investigated.

The so-called amorphous aconitine of commerce is a variable mixture of aconitine, picroaconitine and napelline.

ON THE VOLUMETRIC DETERMINATION OF THE ALKALOIDS.

By L. Barthe.

I have ascertained that the best known alkaloids of vegetable origin are without action upon phenolphthalein, which they leave in the state in which it comes into contact with them; colorless if the medium is neutral or acid, rose colored if it has been rendered alkaline by a mineral base. Such are quinine, cinchonine, cinchonamine, cinchonidine, quinidine, morphine, codeine, cocaine, aconitine (amorphous or crystalline), strychnine, brucine, veratrine, pilocarpine, duboisine, sparteine. On combining this observation (made, I believe, for the first time) with the well-known property of the vegetable bases to turn red litmus blue, I have founded a general method for the volumetric analysis of the alkaloids.

If certain vegetable principles, hitherto regarded as alkaloids, do not react appreciably with phenolphthalein and litmus, it is doubtless because their properties are still imperfectly known, and that their chemical functions require accurate determination. For instance, narcotine, which according to Pictet and Flückiger, can

[1] Dunstan and Ince (1891) give to picroaconitine the formula $C_{31}H_{45}NO_{10}$; and to aconine the formula $C_{26}H_{41}NO_{11}$.

scarcely be regarded as an alkaloid and which is without action upon phenolphthalein and litmus, and atropine, which with these substances behaves like a weak acid.

However it may be, the alkaloid to be determined must be brought to the condition of a soluble salt by means of a mineral acid, *e. g.*, sulphuric acid, either in water or in a slightly alcoholic solution. An excess of acid does not prevent the reaction, but on the contrary rather promotes it. The presence of any salt of the alkaline or earthy bases, and even of a certain number of the heavy metals (*e. g.*, zinc), has no effect upon the process.

The following method of operation is very easily applicable to the determination of the alkaloids above-mentioned, and also of the acids with which they may be combined.

Determination of the Acid.—We introduce into a beaker of Bohemian glass $\frac{1}{1000}$ part of an equivalent of the alkaloid or of a salt of the alkaloid, adding 10 cc. of decinormal sulphuric acid in case of a salt, or 20 cc. in case of a free alkaloid. We add 20 cc. of neutral alcohol at 90 per cent., and three or four drops of an alcoholic solution of phenolphthalein. All the salts of the alkaloids dissolve in this acid alcoholic liquid. We then pour in decinormal potassa until there appears a faint rose-colored tint of phenolphthalein. The number of cc. of decinormal potassa used expresses all the acid, free or combined, existing in the mixture. The rose-tint of phenolphthalein appears only when all the alkaloid is in the free state in the liquid; as a transparent solution if the alkaloid is soluble in a weak, neutral alcohol, or as a precipitate if it is insoluble. We have thus a mixture indifferent to phenolphthalein, but alkaline to litmus in consequence of the liberation of the alkaloid.

Determination of the Alkaloid.—Into a second beaker of Bohemian glass we introduce $\frac{1}{1000}$ of an equivalent of the alkaloid, or of a salt of an alkaloid, with 10 or 20 cc. of decinormal sulphuric acid, and then some drops of a sensitive tincture of litmus. The color is then rendered blue again by means of decinormal potassa. The number of cc. of the alkaline liquid employed in this second saturation represents merely the free acid. If this number is subtracted from the figure which in the foregoing operation measures the entire acid, it expresses exactly the quantity of sulphuric acid combined with the alkaloid in the state of a basic salt, and consequently the weight of the alkaloid itself. It is, in fact, sufficient to

multiply the remainder from the subtraction by $\frac{1}{10000}$ of the equivalent of the alkaloid in question. The factors are evidently:

For anhydrous quinone,	0·0324
" cinchonine,	0·0294
" codeine (H_2O),	0·0317
" morphine (H_2O),	0·0303

—*Comptes Rendus*, vol. cxv, p. 512; *Chem. News*, Novbr. 4, 1892, p. 223.

CONDURANGIN.[1]

By G. Carrara.

Condurangin is a glucoside, first obtained by Vulpius, from the bark of *Gonolobus Condurango*, and considered by some writers as identical with vincetoxin from *Asclepias Vincetoxicum*. It may be separated into two parts, one of which is soluble in water, the other insoluble. The best method of preparing it, is to extract the bark with 95 per cent. alcohol in a reflux apparatus, filter, distil off the greater part of the alcohol, take up with cold water, filter again, add concentrated solution of ammonium carbonate, and heat gently. The precipitate thus formed is washed with hot water, redissolved in cold water, containing, if necessary, a few drops of alcohol, basic lead acetate added, the precipitate thoroughly washed, suspended in water, and decomposed with hydrogen sulphide; the brown solution obtained is then precipitated with a concentrated solution of common salt. The precipitate, after purification, consists of a mixture of the two modifications of condurangin. Insoluble condurangin is precipitated from a benzene solution on the addition of excess of light petroleum, as a light, almost white powder, which melts at 60–61°, and has the percentage composition $C_{20}H_{32}O_6$. Its molecular weight, as determined by the cryoscopic method, agrees with this formula.

Soluble condurangin, obtained by the evaporation of an aqueous extract of the mixed varieties, is a yellowish substance melting at 134°. It appears to have the composition $C_{18}H_{28}O_7$, but its molecular weight could not be determined. On boiling either of these compounds with acids, the principal product is a brown, pitchy substance, insoluble in water. With Fröhde's reagent, an aqueous solution of the soluble condurangin yields a greenish coloration, and after a time a flocculent, green precipitate, the insoluble variety, suspended in water, gives no reaction, or only a yellowish coloration.

[1] *Gazzetta*, **22**, i, 236–242; *Jour. Chem. Soc.*, 1892, p. 1352.

NOTES RELATING TO THE SOLANACEOUS BASES.[1]

By Dr. O. Hesse.

[*Concluded from p. 595.*]

(5) Scopolamine.—This name has been provisionally applied by E. Schmidt[2] to the base, which he considers to be distinct, obtained by Bender from *Scopolia atropoides*, and supposed by him to be hyoscine. Schmidt has shown that the composition of the base in question is represented by the formula $C_{17}H_{21}NO_4$; that it forms, with hydrobromic acid or with gold chloride, crystallizable salts, having respectively the composition represented by the formulæ $C_{17}H_{21}NO_4,HBr + 3H_2O$ and $C_{17}H_{21}NO_4,AuCl_4H$. He has also shown that this base is met with in the ordinary hyoscine hydrobromide of commerce.

The melting point of the above-mentioned gold salt was found by Schmidt first 214°, afterwards 210° to 212°, and subsequently by Schutte 208°.[3] Lastly, the mother-liquor from which the commercial hydrobromide has been obtained, was found to yield a more laminar gold salt, melting at 204°.

More recently, Schmidt[4] has stated that the commercial hyoscine hydrobromide consists, almost exclusively, of a salt, the base of which he proposes to term scopolamine; and that this base, when treated with baryta water, is converted into atropic acid, and a crystallizable base, $C_8H_{13}NO_2$, which has the form of colorless needles, melting at 110°.

But, so far as I have been able to ascertain, commercial hyoscine hydrobromide is nothing else than the true hyoscine salt, which gives a gold salt melting at 198°, as found by Ladenburg and quite recently also by Liebermann and Limpach. Consequently, the different observations of Schmidt and Schutte on the gold salt, as compared with those of Ladenburg, Liebermann, Limpach and myself, can only be due to accidental circumstances.

It has already been shown that the rotatory power of hyoscine in alcoholic solution is almost entirely destroyed by the addition of very little caustic soda, two drops of a 30 per cent. solution being sufficient to produce that effect in 25 cc. of the solution of hyoscine. It is therefore conceivable that the hyoscine may, in the course of its preparation, have undergone some such alteration as hyoscyamine does. Indeed, hyoscine, after having been submitted to such treatment, has been found to give a gold salt crystallizing in extended laminæ. But its melting point of 200° was only somewhat higher than that of the salt containing the normal base. An explanation of the above difference cannot therefore be furnished as suggested.

Schmidt[5] has recently published the investigation of scopolamine, of which preliminary notices had previously appeared.[6] The memoir is dated October 1891; but it contains additions made in the course of the present year, and a

[1] *Annalen der Chemie*, vol. 271, p. 100; reprinted from *Phar. Jour. and Trans.*, September 10 and 17.

[2] *Apotheker Zeitung*, 1890, No. 30.

[3] *Mittheilungen aus dem pharmaceutisch-chemischen Institut der Universität Marburg*, xii, p. 623.

[4] *Chem. Centralblatt*, 1892, p. 704.

[5] *Archiv der Pharmacie*, ccxxx, p. 207.

[6] *Apotheker Zeitung*, 1890, p. 186, and 1891, p. 522.

postscript dated April 12, 1892, refers to the note which had been published by me April 9, 1892,[1] giving a brief statement of the general result of the present paper. Schmidt now explains that commercial hyoscine hydrobromide is "essentially nothing else" than a salt of the base which he calls scopolamine. I am desirous of completing that explanation by stating that the commercial hyoscine hydrobromide and the scopolamine hydrobromide in question, as already shown above, correspond, one with the other, not alone essentially but completely. The small differences which Schmidt observed in the gold salt, prepared from the commercial hydrobromide, probably do not really exist.

Schmidt makes the further proposition to call this base scopolamine, because the name hyoscine is used, in chemical literature, as suggestive of a base isomeric with atropine and hyoscyamine. This has indeed been the case for some ten years past; but those are to blame for the practice who have been engaged in the study of this subject, since they have persistently continued, directly or indirectly, to advocate the formula $C_{17}H_{23}NO_3$. Now that this formula has been placed upon a correct footing, all the requirements of the case are, thereby, satisfied, and it would be inappropriate, at the same time, to alter the name of the substance, more especially since the name hyoscine has long been established in medicine and pharmacy, as well as in trade, while on the other hand, the name scopolamine, which is scarcely known, would first have to become familiar. It is doubtful whether that would ever happen. I am therefore desirous of strenuously urging chemists to adhere to the use of the name hyoscine, which was selected by Ladenburg for the base in question, and has been in general use up to the present time.

Finally, in reference to the term scopoline, by which Schmidt proposes to designate the corresponding volatile base, it may be mentioned that a glucoside is already understood under this name in chemical literature. Consequently the name cannot be so applied without risk of confusion.

(6) ATROPAMINE.—This base was first obtained by me from the mixture of bases constituting crude atropine, and resulting from the treatment of a large quantity of belladonna root. It was not, as stated by Merck, discovered in belladonnine. Since atropamine is precipitated from its acetic acid solution by sodium chloride, while the crystallizable constituents of crude atropine—atropine and hyoscyamine—are not precipitated in that way, the separation of the base from these latter was not attended with much difficulty. Having regard to its characters, it would not therefore be difficult to detect the presence of atropamine in belladonna root from other sources, although the amount present is generally very minute.

I have now only to add to my previous communication[2] on this subject that the platinum salt of atropamine can also be obtained from a cold concentrated water solution, as pale yellow scales, melting with decomposition, at 203° to 204°.

In regard to the base resulting from the splitting up of atropamine, it cannot, according to what has been stated above, be the pseudotropine discovered by Ladenburg, or oscine, since that has a totally different composition from the base in question. On the other hand, it cannot be tropine, because the melting

[1] *Pharmaceutische Zeitung*, 1892.
[2] *Annalen*, cclxi, p. 87.

point of the platinum salt is essentially lower than that of the tropine salt. It is true Kraut[1] has stated that the platinum salt of tropine has different characters according to the mode in which the splitting up of atropine is effected; but even that circumstance would not be of much assistance, because the volatile bases from tropine and from atropamine, as well as their platinum salts, were prepared under precisely the same conditions and compared with each other. So long as the accuracy of these observations is not experimentally disproved, the base obtained by the splitting up of atropamine must be regarded as being distinct from tropine. In order to obviate erroneous conceptions in respect to this matter I therefore designated that base β-tropine.

I have further examined the small remnant of platinum salt, as follows: After three times recrystallizing from water the melting point of the salt was found to be 187°. A portion dissolved in water was decomposed with sulphuretted hydrogen, the clear filtered solution evaporated, the crystallized residue dissolved in water, mixed with caustic soda and the base shaken out with chloroform. The clear chloroform solution gave on evaporation long colorless crystals of β-tropine, which covered the sides of the vessel like ice crystals. In moist air they soon deliquesced. Dried in the exsiccator the base melted at 60° to 61°. Heated to 53° in the exsiccator it soon vaporizes; it is readily soluble in water; on adding platinum chloride to the solution and evaporating, the platinum salt crystallizes out in the original form and melts at 186° with decomposition.

For the sake of comparison, I have prepared tropine from atropine, and operated with its chloroform solution under exactly the same conditions described above. The crystals, obtained on evaporating the solution, did not present more than scanty indications of the ice crystal form; but were flat and often spear-shaped needles that were apparently quite as hygroscopic as those of β-tropine. On the other hand, it was found that tropine vaporizes but very little under the same conditions.

The difference between these two forms of tropine consist, therefore, so far as can be at present made out, chiefly in the melting points of the platinum salts and the greater volatility of β-tropine.

(7) BELLADONNINE.—Under this name Hübschmann[2] understands a base the sulphate of which is contained in the mother liquor left in the preparation of atropine sulphate. The belladonnine was separated from the salt by alkali, and was, like the sulphate, amorphous. Merck understands belladonnine to be the base from the mother liquor which, in the preparation of atropine, gives no further crystallizable base. He is also of opinion that the crude belladonnine examined by Dürkopf,[3] had been, in part only, derived from belladonna root, on account of the considerable amount of hyoscine it contained. Kraut[4] showed that belladonnine is but little decomposed by boiling with baryta water, and he thus pointed out a mode of obtaining this base in a state of purity. By the splitting up of a base purified in that way, Merling stated that he had obtained tropine; but his investigation was limited to the determination of the

[1] *Ibid.*, cxxxiii, p. 97.
[2] *Schweizerische Zeitschrift für Pharmacie*, 1858, p. 123.
[3] *Berichte*, xxii, p. 3183.
[4] *Annalen*, cxlviii, p. 239 and *Berichte*, xiii, p. 165.

crystalline form and the amount of platinum of the platinum salt. He gave $C_{17}H_{21}NO_2$ as the formula of this base.

I have already been able to show that atropamine is readily convertible by the action of baryta water, as well as hydrochloric acid into belladonnine; and that the base, so obtained, possesses characters which correspond well with Merling's description of belladonnine. I may here add that by repeatedly evaporating a solution of atropamine hydrochloride, at about 80°, the atropamine salt may be quantitatively converted, slightly acidulated with hydrochloric acid, into hydrochloride of belladonnine. When, likewise, a solution of atropamine hydrochloride in moderately concentrated hydrochloric acid, is warmed, the splitting up of the atropamine is preceded by its conversion into belladonnine, which may be separated, as hydrochloride, by precipitation by sodium chloride. In both instances there is obtained belladonnine hydrochloride, which is amorphous, and may be distinguished from the original atropamine hydrochloride by its behavior with platinum or gold chlorides.

(8) APOATROPINE.—This base was obtained by Pesci,[1] by the action of nitric acid upon atropine; and also by Ladenburg,[2] by repeatedly evaporating a solution of tropine atropate, mixed with dilute hydrochloric acid. Ladenburg named the base atropyl-tropeine. Merck obtained apoatropine as a secondary product in the preparation of atropine; it was therefore probably produced by the action of an acid upon the atropine. According to Pesci, it is rapidly converted into atropic acid and tropine when boiled with baryta water, and in this respect it differs from belladonnine, as well as from atropamine. Otherwise it possesses, according to Merck, apparently, the same characters as atropamine, though with the following differences:

	Apoatropine.	
Free base,	Needles,	melts at 60° to 62°
Hydrochloride,	Laminæ,	" 237° to 239°
Platinum salt,	Scales,	" 212° to 214°
Gold salt,	Long needles,	" 110° to 111°
	Atropamine	
Free base,	Amorphous,	melts below 60°
Hydrochloride,	Laminæ,	" at 236°
Platinum salt,	Scales and needles,	" at 203° to 204°
Gold salt,	Brilliant laminæ,	" at 112°

As a further distinction between apoatropine and atropamine, it may be mentioned that apoatropine is produced by the action of dilute hydrochloric acid; while atropamine is, in that way, destroyed and converted into belladonnine, Hence it is evident that, notwithstanding Merck's assertion, atropamine cannot be identical with apoatropine.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, November 15, 1892.

The meeting was called to order; E. M. Boring, Ph. G., was elected Chairman, and the reading of the minutes of the October meeting was dispensed with.

[1] *Berichte*, xv, p. 530, and *Gazetta Chim.*, xi, p. 538; xii, p. 60.

[2] *Annalen*, cxvii, p. 102.

Dr. Lowe read a paper upon the *use of compressed gases in medical practice.* The gases used most are oxygen and nitrogen monoxide, the latter being that which is advertised as compound oxygen by medical quacks. An apparatus for the inhalation of gases, constructed by the White Dental Co., of Philadelphia, was also exhibited and its uses explained.

The reading elicited a good deal of discussion. Mr. Beringer stated that other gases beside those mentioned were in use for medical purposes, sulphuretted hydrogen and chlorine being of the number.

Prof. Trimble said that air and oxygen had been liquefied and exhibited at a meeting of the Royal Institution, London ; both were then passed around the meeting in glasses, those handling them being cautioned not to touch the glass, but only to take hold of the handle made of a non-conducting material, as the temperature was — 180° C. in one case and — 192° C. in another. The atmosphere, compressed, would make a sea thirty-five feet deep around the globe.

Mr. McIntyre stated that medication by means of compressed gases had been found efficacious, but that there were many persons who did not know how to inhale them.

Liquefied ammonia, another of the compressed gases, may be expected to work great changes in connection with practical pharmacy, as a means of refrigeration.

The use of compressed carbonic acid was also discussed, as a means of aërating beverages, and inquiry was made whether it was safe to use it ; the reply was that the company which operate Leffman's patent for making carbonic acid from magnesite test their cylinders to 4,000 pounds, and charge them up to 1,000 pounds pressure.

Nitrous oxide gas cylinders like those exhibited have one hundred gallons of gas compressed into them, and are cooled to 5° C. The amount of gas that is contained in the cylinders is estimated partly by the pressure and partly by the weight ; the weight of oxygen contained in a cylinder is said to be 7½ ounces.

One of the advantages claimed for the compressed gases is great portability. Some are quite valuable as fire extinguishers, like carbonic acid, and sulphurous acid. Chloroform was stated to be of value for extinguishing petroleum fire, but no experiments seem to have been made on a large scale for such purposes. Chloride of ethyl compressed in tubes with capillary orifice has been used for local anæsthesia, and its value for this purpose was possibly due to local refrigeration.

Professor Maisch read the copy of an American prescription which had been sent to him from Europe, where it had been presented to be compounded, one of the articles called for being *jurebebine.* He stated that jurebebine was isolated by Dr. Greene, of the U. S. Navy, in 1878, from the green fruit of a solanum indigenous to Brazil, and that the name jurubeba or juribeba was used in that country for several species of solanum and other solanaceous plants, among them being *Sol. paniculatum, S. toxicarium* and *S. insidiosum.* The leaves were stated by Peckolt to be used as an infusion, of the strength of 2 gm. to 500 gm. of water, and given in doses of a wineglassful four times a day. Dr. Greene has shown that the alkaloid is not identical with solanine.

It was stated that the prescription in question was sent out by an advertis-

ing quack, that the ingredients varied sometimes, and that such articles like jurubebin which are not in the market, were simply ordered as a blind with the view of compelling the victim to have the prescription compounded by the advertiser.

The question was asked, to what extent should pharmacists comply with the directions of physicians when A B's or X Y's make of any special article is ordered?

Professor Maisch said that the physician's order should be complied with; but that it had been his practice to decline putting up prescriptions ordering galenicals of other manufacturers, and at the same time to let physicians know that he took pride in making such articles himself, and that such notification was generally satisfactory to the physician.

It was suggested that medical men could and in most cases would cure the trouble, if apothecaries would let them know that they had such remedies on hand of their own make, and that they were well and properly made. Mr. Beringer said we ought to comply with the prescription of the physician, and if making a similar preparation should acquaint the physician with the formula generally the physician would be satisfied with it.

On motion adjourned. T. S. WIEGAND, *Registrar.*

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

All Around the Year, 1893. Designs by J. Pauline Sunter, Boston. Lee & Shepard. Price, in box, 50 cents.

This calendar, like its predecessors, is printed on heavy card-board, gilt edged, with chain, tassels, and ring, and is of convenient size. The designs on each monthly card, are very pleasing, artistically executed, and printed in several colors.

Grasses of the Pacific Slope, including Alaska and the adjacent islands. Part I. By Dr. Geo. Vasey, Botanist U. S. Department of Agriculture. Washington: Government Printing Office. 1892. 4to.

In continuation of the work done in regard to the grasses of the southwestern United States, the concluding portion of which was announced on p. 110 of our present volume, the pamphlet now before us has been issued in the same style as the former. We learn that the grasses of the Pacific Slope, including Alaska, number nearly 200 species, specifically distinct from those growing east of the Mississippi. There are 50 plates with 52 species, most of them illustrated for the first time; the descriptions are mostly the work of Prof. L. H. Dewey.

Contributions from the U. S. National Herbarium. Vol. I, No. V. Published by authority of the Secretary of Agriculture. Washington: Government Printing Office. 1892.

The pamphlet contains lists of plants from different collectors obtained along the western coast of America, from Patagonia northward; also a revision of the North American species of Hoffmanseggia; and an index of new species of American phanerogams and pteridophytes published in 1891. This index, prepared by Josephine A. Clark, is in two parts, systematic and alphabetic, and covers 36 pages.

Formulaire de l'Antisepsie et de la Désinfection, par H. Bocquillon-Limousin, pharmacien de 1re classe, etc. Avec une introduction par le Dr. Verchère, chirurgien de Saint-Lazare. Paris: J. B. Baillière et Fils. 1893. 16mo. Pp. viii and 298. Price, 3 francs.

Formulary on antisepsis and disinfection.

This is a companion volume to the one by the same author noticed on page 334 of our June number, and in which the subject of antisepsis and antiseptics could be but briefly treated. In the present work we find five chapters, of which the first treats of the influence of various agents upon the disease-producing microbes, which is followed by a compilation of the antiseptics recommended by eminent physicians and surgeons for various organs and different classes of disease. The third chapter gives the different forms of antiseptic preparations with the necessary furmulas, and in the fourth chapter the antiseptic agents are briefly described in alphabetical order. The concluding chapter treats of the various methods of disinfection, more particularly as applied to the person, to furniture, rooms, etc., to the sterilization of water, milk, and other liquors, and to the precautions recommended in cases of various epidemics. As will be noticed the subject-matter is quite comprehensive; but though necessarily the account under each heading is brief, nothing that might be of practical value appears to have been omitted; hence the little work will be found of much usefulness in all cases where disinfectants or antiseptics are indicated.

Over one thousaud Prescriptions or favorite Formulas of various Authors, Teachers and Practicing Physicians, the whole being carefully indexed and including most of the newer remedies. Published by The Illustrated Medical Journal Co., Detroit, Mich. Pp. 132. Price, $1.

The prescriptions have been collected from various sources, and are printed without any special order, but can be readily consulted through the copious-index of diseases. Each printed page is faced by a blank page, which may be used for notes intended to be preserved.

Sur le Dadi-go on Balancounfa, plante nouvelle cléistogame et distopique, usitée comme tænifuge sur la côte occidentale de l'Afrique tropicale. Par M. Édouard Heckel, Professeur à la Faculté des Sciences de Marseille et à l'École de Médecine.

On Dadigo or Balancounfa, a new cleistogamous and distopic plant, used as a tænifuge on the west coast of tropical Africa.

A reprint from the Annales de la Faculté des Sciences of Marseille, 1891, with three plates. The plant in question has been named by the author *Ceratanthera Beaumetzi*. From his experiments it appears that the tænifuge properties are due to the volatile oil.

Sur la Graine d'Owala. Par le Docteur Ed. Heckel. On owala seed.

A reprint from Répertoire de Pharmacie, August, 1892. The seed is obtained from *Pentaclethra macrophylla*, Bentham, a tree of the order leguminosæ, indigenous to Western Africa. The seeds yield 36 per cent., or after the removal of the integuments, 44 per cent. of a valuable butyraceous fat which melts at 24·8° C.

Ueber Zersetzbarkeit des Chloroformium medicinale Pictet. Von E. Biltz.

On the decomposition of Pictet's medicinal chloroform.

The author shows that chloroform, deprived of alcohol in the cold, suffers decomposition by light and air as rapidly as such, which after the removal of the alcohol is distilled. (See July number, p. 391).

Address by Albert B. Prescott, retiring President, before the American Association for the Advancement of Science. Pp. 16.

"The immediate work in chemical science" is the subject of this address, which was delivered at the Rochester meeting of the Association in August, 1892.

Tuberculin and the Living Cell. By Chas. Dennison, A.M., M.D., Professor of Diseases of the Chest and Climatology, University of Denver, etc. Pp. 24.

A reprint from "The Medical News" of September 17, bearing the explanatory title "An inquiry as to how one aids the other in the fight against tuberculosis."

Le Chloral et ses Dérivés. Par M. J. B. J. Roussel. Coulommiers. 1892. 4°. Pp. 110.

Chloral and its derivatives.—A very interesting and full review of the chemistry and application of chloral and its numerous derivatives, presented as a thesis to the École supérieure de Pharmacie at Paris.

Sur quelques nouveaux Chlorures doubles. Par M. Chassevant Allyre. Paris. 1892. 4°. Pp. 41.

On several new double chlorides is the title of this thesis, treating of the double chlorides of lithium with manganium, iron, nickel, cobalt, copper, cadmium and tin, prepared by the author. A review of the literature on double chlorides of other alkali metals is also given.

Sur la Puissance et le Grossissement de la Loupe et de la Microscope. Par Julien Lefèvre, professeur suppléant à l'École de Médecine de Nantes. 1892. 4°. Pp. 27.

A thesis presented to the Paris School of Pharmacy for the degree of "Pharmacien de 1re classe," and treating of the power and amplification of the lens and of the microscope.

Minutes of the Fortieth Annual Meeting of the American Pharmaceutical Association. Pp. 154.

The pamphlet was issued to the members in advance of the bound copy of "Proceedings," and contains the minutes of the general sessions and of the Section on Commercial Interests, including the various reports rendered to these bodies. A second pamphlet containing the minutes of the Sections on Scientific Papers and on Legislation and Education, and covering 240 pages, was distributed early in December.

VARIETIES.

Potassium permanganate has been recommended by Bokai (*St. Petersburg med. Woch.*) as an antidote in phosphorus poisoning. Dr. Hognos, of Buda-Pest (*Gyògyaszat*, 1892, No. 2) has treated two cases of phosphorus poisoning successfully with the permanganate, though in both cases large quantity of phosphorus had been taken. In each the stomach was first washed out with tepid water, and then 15 ounces of a $\frac{1}{10}$ per cent. solution of permanganate of potash injected into the stomach and left there.—*The Med. Chronicle*, September, 1892.

INDEX

TO VOL. LXIV (VOL. XXII, FOURTH SERIES), OF THE AMERICAN JOURNAL OF PHARMACY.

Absinthiin, preparation and characters, ... 311
Acacia Farnesiana flowers used in perfumery, ... 171
Aceta, gradual decrease of acetic acid, ... 143
Acetanilide, purity of, ... 615
Acetyl-*p*-amidosalol. (See Salophen.)
Acetylene, preparation from bromoform, ... 314
Acid, acetic, diluted, strength of absolute acid, ... 183
  ampelochroic, coloring matter of the vine (Gautier), ... 626
  anemonic, preparation and chemical formula, ... 373
  benzoic, separation of salicylic acid (Schaap), ... 442
  boric, characters of two varieties, ... 312
    effect on bacteria (Jaenicke), ... 97
    in vegetables, ... 137
    toxic effects of, ... 192
  boroboric, composition and use, ... 99
  carbolic, crude, assay of, ... 566, 614
  citric, commercial, presence of lead, ... 405
    crystallization of, ... 410
  daturic, properties of salts of, ... 366
  gallic, behavior in the organism (Mörner), ... 438
    conversion into benzoic acid, ... 79
  hydrobromic, diluted, strength of and presence of other acids, . . . 184
  hydrocyanic, action on calomel, ... 311
    Vortmann's test for, ... 543
  isoanemonic, formation of, ... 372
  lactic, use of, in croup, ... 607
  molybdic, color reagent for aromatic oxycompounds, ... 439
  nitric, action on metals (Montemartini), ... 618
    diluted, percentage strength of, ... 184
    percentage strength of, ... 184
  nitrous, use as a disinfectant, ... 190
  oleic, tests of purity, ... 374
  phosphoric, volumetric determination, ... 572
  salicylic, detection in salicyl-aldehyd and methyl salicylate, ... 22
    glycerin a solvent for, ... 29
    preparation without distillation, ... 462
    reaction with exalgine, ... 571
    separation from benzoic acid (Schaap), ... 442
  succinic, formation during fermentation, ... 522
  sulphurous, decomposition by charcoal, ... 466
    result of assay, ... 183
    test paper for, ... 463
  tannic, behavior in the organism (Mörner), ... 438
  tartaric, commercial, presence of lead, ... 405
    synthesis of, ... 467
  tetrathiodichlordisalicylic, preparation and antiseptic properties of, . 610
  thiolinic, preparation and characters, ... 309

Acid, thiophene-sulphonic, characters of, . . . 315
thiosalicylic, preparation and use, . . . 464
tumenol-sulphonic, preparation of, . . . 81
Acids, normal, gravimetric standardization of, . . . 374
Aconine, formation, properties and conversion into aconitine (Dunstan and Passmore), . . . 209
Aconitine, formula and properties (Ehrenberg and Kurfürst), . . . 637
reactions of, . . . 415
Aconitum Napellus, alkaloids of (Dunstan and Umney), . . . 207
Adulterations, discussion on, . . . 216
Agathine, medicinal use and characters, . . . 409
Agrostemma Githago, character and action of sapotoxin (Kroskal and Kobert), . . . 320
Albany College of Pharmacy, . . . 279
Albumin, test for in urine, . . . 142
Albumone, isolation and properties, . . . 230
Alcock, F. H. Assay of jalap, . . . 533
Alcohol, amyl, production in the fermentation of starch by a bacterium (Perdrix), . . . 152
Alcohols, detection in spirits of wine (Bardy), . . . 627
Alkaloids, estimation in extracts, . . . 25, 26
indicator for assaying, . . . 521
volumetric determination of (Barthe), . . . 638
Allantoine, physiological action of, . . . 231
Alloxanthine, physiological action of, . . . 231
Allyl sulphide, properties of, . . . 612
Aloes, cause of difference of character and odor, . . . 543
Aluminium paraphenolsulphonate, preparation and action, . . . 524
Ambergris, characters of, . . . 570
American Pharmaceutical Association, . . . 330, 443
Ammonia, color reaction with syrup ferrous iodide, . . . 408
water, percentage strength of, . . . 184
Ammonium molybdate, use as a reagent, . . . 572
Amyl nitrite, method of examination, . . . 448
Amyloid, vegetable, preparation and characters (Winterstein), . . . 483
Anagallis arvensis contains digestive ferment, . . . 608
Analgene, formula and preparation, . . . 310
Andromeda mariana, constituents of leaves, . . . 458
Anemon-camphor, crystallization of, . . . 372
Anemonin, isolation, characters, etc., . . . 372
Angustura bark, constituents of (Beckurts and Nehring), . . . 410
bark, false, percentage of alkaloids (Smythe), . . . 115
Anise, value as galactagogue, . . . 604
Antifebrin derivatives, action of (Aronsen), . . . 103
Antimonious chloride, solution in sodium chloride, . . . 313
Antimony, use in whooping-cough, . . . 517
Antinonnin, properties and use, . . . 521
Antipyrine, chlorine derivative of, . . . 610
in infantile diarrhœa, . . . 139
method of dispensing with euphorin, . . . 142
test for, . . . 142
use for checking secretion of milk, . . . 79
benzoate, preparation of, . . . 141
picrate, preparation of, . . . 141
Antisepsis, dental, mouthwash for, . . . 406
during epidemics, . . . 467
Antiseptic mixture, Cavazzini's, . . . 607
Apoatropine, preparation and character, . . . 644
Arima, mineral water, constituents of, . . . 518
Aristol, use in cancer, . . . 119

Aristolochin, principle of seeds of Aristolochia species, ... 82
Aronson, H. Action of antifebrin and phenacitin derivatives, ... 103
Arrowroot plantations of Queensland, ... 631
production in Bermuda, ... 171
Arsenic, powdered, spontaneous combustion, ... 613
cyanide, preparations and properties of, ... 606
Asafœtida, percentage of alcohol-soluble matter, ... 385
Asaprol, see Calcium β-naphtholsulphonate, ... 517
Asepsis and antisepsis, preparation of dressing, ... 386
Ashinoyou, mineral water, constituents of, ... 518
Atami, mineral water, constituents of, ... 518
Atropamine, preparation and properties, ... 642
Atropine, hæmostatic effects of, ... 230, 552
preparation and characters of salts, ... 587
use in hyperacidity of the stomach, ... 515
Atropinum naturale, characters of, ... 589

Bacillus amylozymicus, ferments starch with production of amyl alcohol (Perdrix), ... 152
Ballantyne, H. and R. T. Thomson. Revision of constants for fats and oils, ... 377
Balmony, constituents of overground portion, ... 65
Balsam, tooth, formula for, ... 463
Bardy, C. Detection of higher alcohols in spirits of wine, ... 627
Barium, test for absence from strontium salts, ... 313
chloride, in scrofula, ... 232
medicinal use and effect, ... 606
poisoning by, ... 137
salts, toxicity of, ... 192
Barthe, L. Volumetric determination of the alkaloids, ... 638
Baur, A. Artificial musk, ... 31
Bebeerine, reactions of, ... 414
Beck, A. L. Preservation of syrup of iodide of iron, ... 18
Beckurts, H. and P. Nehring. Angustura bark, ... 410
Bedloe, Edw. Camphor, growth and manufacture in Formosa, ... 37
Beeswax, process of analysis (Mangold), ... 532
test for purity of, ... 23
Belladonnine, character and composition, ... 643
Benzonaphthol, an intestinal antiseptic, ... 77, 517
Benzoyloscine, character and reactions, ... 595
Benzoylpseudotropeine, alkaloid of Java coca-leaves (Liebermann), . . . 44
characters of, and salts, ... 579
Berberis aquifolium and B. vulgaris, alkaloids of (Rüdel), ... 379
Beringer, G. M. Formulas for several pharmaceutical preparations, . . 4
Oleoresins, ... 145
Some commercial vanillas, ... 289
Value of Ehrlich's urine test for typhoid fever, ... 559
Berkenheim, A. Menthol, ... 491
Biernacki, E. Influence of temperature on digestive ferments, ... 87
Bismuth benzoate, preparation of, ... 517
salicylate, method of preparation, ... 76
Blackader, Dr. Infants' food, ... 151
Blood, coagulation of (Pekelharing), ... 201
Borragineæ, active principle of, ... 140
Borax, action of, on chloral, ... 76
reaction with sodium bicarbonate in glycerin, ... 451
Borneol acetate, in oils of Abies, ... 613
Boron, amorphous, properties of, ... 616
Bougies, lactic acid, preparation and use, ... 308
British Pharmaceutical Conference, ... 535

Bromine, separation from chlorine and iodine (Schierholz), ... 574
Brooke, E. and F. A. Ringer. True and commercial pareira, ... 255
Brooklyn College of Pharmacy, ... 279
Brown, D. Impurity in chloroform, ... 238
Brucine and strychnine, separation of, ... 449
Brush, aseptic, use of Egyptian *luffa*, ... 40
Bryonia dioica, constituents of leaves, ... 470
Butter acids, separation and character of (Koefoed), ... 582
pure and adulterated, microscopical examination (Ferdinand), . . . 636
Butylethylbenzene, derivatives, artificial musk, ... 33
Butylmetaxylene, derivatives, artificial musk, ... 33
Butyltoluene derivatives, artificial musk, ... 31

Cacao seed, constituents of, ... 568
Cadmium, action of nitric acid on, ... 618
Caffeine, estimation of, in coffee, ... 194
estimation of, in tea, ... 468
physiological effect of, ... 231
Calcium bisulphite, properties of, ... 467
hypophosphite, results of assay, ... 450
β-naphtholsulphonate, characters of, ... 517
salicylate, method of preparation, ... 23
salts for therapeutic use, ... 365
tartromalate, isolation from grape juice and wine, ... 365
Calx sulphurata, results of examination (Kaercher), ... 618
Camilla, Stefana. Italian yellow waxes, ... 196
Camphor, compounds with aldehydes, process for, ... 30
for hypodermic injection, ... 465
growth and manufacture in Formosa (Bedloe), ... 36
Canna edulis, cultivation in Queensland, ... 631
Cantharidin, process of preparation, ... 461, 608
Capsicum annuum, constituents of, ... 370
Carrara, G. Bark of Gonolobus Condurango, ... 92
Condurangin, ... 640
Carvacrol, preparation of, ... 228, 604
Cassia holosericea, source of Aden senna, ... 386
Castoreum, inferior, percentage of ash, etc., ... 233
Cement, diamond, preparation of, ... 409
porcelain, preparation of, ... 409
tooth, formula for, ... 463
universal, preparation of, ... 409
Ceratanthera Beaumetzi, African tænifuge, ... 462
Cerate, cantharidal, process of preparation, ... 462
Charcoal, animal, B. P. requirements, ... 541
Chemical symbols, ... 448
Chicago College of Pharmacy, ... 279
Chimaphila umbellata and C. maculata, comparative analysis (Peacock), . 295
Chittenden, R. H. and T. B. Osborne. Proteids of maize, ... 428
Chloral, action of borax on, ... 76
Chlorine, separation from bromine and iodine (Schierholz), ... 574
Chloroform, decomposition on exposure, ... 391, 647
impurities of, ... 144, 238
Pictet, action of sunlight, ... 25
quality of commercial, ... 543
solubility of iodine in (Duncan), ... 100
tests for purity, ... 308
Cholesterin, preparation from phanerogamous plants, ... 606
Chrysanthemum flowers, alkaloid from (Zuco), ... 163
Cinchona barks, cultivated at Reunion, value of, ... 193
estimation of quinine (Schmidt), ... 608

Cinchonamine, physiological action of, ... 607
Cincinnati College of Pharmacy, ... 388
Claassen, Edo. The flora of Northern Ohio, ... 166, 211
Clague, T. M. Artificial human milk, ... 203
Cobalt, action of nitric acid on, ... 618
Coca, from different localities, quality, ... 248
leaves, Java, alkaloid of (Liebermann), ... 44
Cocaine, action upon blood constituents, ... 230
anæsthetic properties, latent and intensified, ... 229, 368
milk of, preparation, ... 368
reactions of (Stead), ... 317
test for, ... 462
cantharidate, preparation and uses of, ... 610
Codeine, reactions of, ... 414
sulphate, insoluble residue in the solution (England), ... 120
Coffee, assay of, ... 194
cultivation of, in Jamaica (Lloyd), ... 396
Coleman, J. B. Rapid method of solution in the cold, ... 375
Collodion, decomposition of iodoform in, ... 194
Condurangin, character of (Carrara), ... 640
Conduransterin, constituent of Gonolobus Condurango bark, ... 93
Copaiba, African, so-called, comparison with South American (Umney), . 33
from different localities, quality, ... 248
Copper, atomic weight of, ... 368
presence in galenical preparations (Haussmann), ... 7
salts, new reagents for, ... 77
Cordial, neutralizing, formula for, ... 4
Corn cockle, character of sapotoxin, ... 320
Crayons, iodoform, elastic, formula for, ... 316
Creasote, use in tuberculosis, ... 112
valuation of, ... 195
Crookes, W. Flame of burning nitrogen, ... 441
Croup, treatment of, ... 607
Crystals, artificial coloring of (Lehmann), ... 321
Cubebs, from different localities, quality, ... 248
spurious, source, character, etc. (Holmes), ... 494
Cumin, value as galactagogue, ... 604
Curry, G. L. Gillenia stipulacea, ... 513
Cynoglossine, alkaloid from borragineæ, ... 140

Dammar, detection of resin in, ... 613
Datura alba, constituents and use in Japan, ... 523
Davies, D. H. Koumiss, ... 629
De la Cour, J. C. Estimation of eugenol in oil of cloves, ... 508
Dermal prescriptions, formulas for various, ... 189
Dermatol, use of, in otorrhœa, ... 607
Diaphtherin, characters and reaction with iron, ... 374
(See also Oxychinaseptol.)
Digestion, chemistry of (Hayens and Winter), ... 241
Digitalein, properties of, ... 134
Digitalin, characters and detection of impurities (Kiliani), ... 41
solubilities of commercial, ... 315
Digitalis purpurea, dose of, ... 367, 468
hypodermic injections of, ... 608
constituents of, ... 415
Digitogenin, preparation of, ... 425
Di-iodo-thiophene, substitute for iodoform, ... 190
Disinfectol, characters of, ... 135
Diuretin, use in infantile practice, ... 228
Dowd, Andrew W. Andromeda Mariana, ... 458

Dressing, sublimate, acid, preparation, ... 451
Drops, toothache, formulas for, ... 463
Druggists prosecutions against, ... 281
Drugs, preservation of, ... 80
Dulcine or phenetol carbamide, ... 611
Duncan, W. Solubility of iodine in chloroform, ... 100
and T. S. Tweedie. Commercial goa powders, ... 93
Dunstan, Prof. and F. W. Passmore. Formation of aconine and conversion into aconitine, ... 209
and J. C. Umney. Alkaloids of true Aconitum Napellus, ... 207
Dvorkovitch, P. Examination of Chinese tea, ... 48
Dymond, T. S. A mydriatic alkaloid in lettuce, ... 46

Ehrenberg, A. and C. Kurfürst. Aconitine, ... 637
Elixir, compound, of iodine, preparation and use, ... 261
yerba santa, administration for disguising taste of quinine (Strouse), . 6
Emulsion, cod-liver oil, method of preparation, ... 133
salol, process of preparation, ... 519
England, Jos. W. Infusion of digitalis, ... 361
Iodine, new method of giving it, ... 20
Note on codeine sulphate, ... 120
Oxygen and its medicinal application, ... 11
Percentages in solutions, ... 72
Ephedra monostachya, alkaloid present in, ... 234
vulgaris, alkaloids present in, ... 234
use in rheumatism, ... 193
Epidermin, a surgical dressing, ... 368
Ergosterin, from cryptogamous plants, ... 607
Erythrocentaurin, from Erythræa Centaurium, ... 311
Erythrophlœine, toxicity of, ... 194
Essence, lavender, ammoniated, formula for, ... 518
lemon, manufacture of, ... 545
Ether, use as a menstruum (Sawyer), ... 624
Ethyl bromide, cause of impurities, ... 143
Eucalyptol, characters of pure, ... 541
Eugenol, estimation in oil of cloves (De la Cour), ... 508
acetamide, a new anæsthetic, ... 465
Eupatorin, principle of Eupatorium perfoliatum (Shamel), ... 511
Eupatorium perfoliatum, constituents of root (Kaercher), ... 510
rotundifolium, constituents (Shaw), ... 225
Euphorbia antiquorum, effect of milk juice, ... 468
pilulifera, medicinal use, ... 584
Euphorine, method of dispensing with antipyrine, ... 142
Exalgine, reaction with salicylic acid, ... 571
Exodyne, an antipyretic mixture, ... 139
Extract, beef, process of manufacture (Shinn), ... 561
belladonna, alkaloids in, ... 26, 141
Goulard's, substitute for, ... 371
glycyrrhiza, purification of, ... 615
nux vomica, estimation of alkaloids, ... 25
thyroid, preparation and medicinal use (White), ... 634
vanilla, character of commercial (Haussmann) 71
fluid, cinchona, proper menstruum (Remington), ... 458
erythroxylon, proper menstruum (Remington), ... 458
glycyrrhiza, method of preparation, ... 133
nux vomica, assay method (Lloyd), ... 337
Turkey corn, suitable menstruum for, ... 133
Extracts, containing chlorophyll, estimation of alkaloids, ... 26
dry, containing glycyrrhiza, estimation of alkaloids, ... 26

Fats, iodine absorption of, ... 407
revision of constants employed in analysis of (Thomson and Ballantyne), 377
use of acetic acid for testing, ... 516
Fennel as a galactagogue, ... 604
Ferdinand, J. Microscopical examination of butter, ... 636
Ferments, digestive, influence of temperature (Biernacki), ... 87
Ferrous iodide, action upon starch and filtering paper, ... 235
Ferrum reductum, use of purified hydrogen in the preparation of, ... 461
Fischer, Emil, of Berlin University, ... 500
Flora of northern Ohio (Claassen), ... 166, 211
Flowers, artificial coloration of, ... 470
Flückiger, Memorial, ... 172, 500
Food, infants' (Blackader), ... 151
Formic aldehyde, antiseptic properties of, ... 604
Fruit juices, preparation of, ... 386
preservation of, ... 231
Fumarine, present in a papaveraceous plant, ... 404

Galactagogue remedies, various, ... 604
Galega officinalis as a galactagogue, ... 604
Gas tester, Shaw, construction of, ... 595
Gases and liquids, general law applicable to (Wanklyn), ... 236
Gases, compressed, medicinal use of, ... 601, 645
Gastric juice, chemistry of (Hayens and Winter), ... 241
Gautier, A. Coloring matters of the vine, ... 626
Gauze, iodoform, adulteration of, ... 404
assay of, ... 567
Gillenia stipulacea, results of analysis (Curry), ... 513
trifoliata, constituents of, ... 121
Glass, action of water on (Mylius and Forrester), ... 472
Glechoma hederacea, properties, use and constituents, ... 66
Glue, marine, preparation of, ... 407
Glycerin, as a wound dressing, ... 29
salol, formula and use, ... 521
Gold chloride and sodium, medicinal use and dose, ... 466
Gonolobus Condurango bark, constituents, etc. (Carrara), ... 92, 640
Grindelia robusta, constituents of, ... 370
Grittner, A. Detection of resin oil in fatty and mineral oils, ... 376
Guaiacol biniodide, a new aristol, ... 195
Guaiacol carbonate, preparation and character, ... 82
Gum arabic, artificial, preparation of, ... 516
source of commercial, ... 329
arabol, composition of, ... 309
Gymnocladus canadensis, description and constituents (Martin), ... 557

Hæmogallol, preparation and administration, ... 82
Hæmol, preparation and administration, ... 82
Hahn, John H. Compressed tablets and tablet triturates, ... 360
Harrop, Jos. Business aspects of pharmacy, ... 74
Haussmann, F. W. Commercial extract of vanilla, ... 71
Note on soda mint, ... 187
Presence of copper in galenical preparations, ... 7
Hayens and Winter. Chemistry of digestion and of gastric juice, . . . 241
Heaton, C. W. and S. A. Vasey. Analysis of peptones, ... 153
Heinitsh, Chas. A. An essay on spices, ... 357
Helbing, H. and F. W. Passmore. Analysis of coal tar preparations, . . 484
Helenin, medicinal use of, ... 138
Henry, Wm. F. Liatris spicata, ... 603
Hesse, O Notes relating to solanaceous bases, ... 587, 641
Heusler, F. Lignite tar, ... 585

Holmes, E. M. False pellitory root, ... 90
Relation of geography and materia medica, ... 246
Spurious cubebs, ... 494
Holmes, W. M. Microscopical characters of spurious Pareira Brava, . . 250
Hooper, D. Value of unofficial parts of ipecacuanha, ... 162
Hoseason, J. H. Volumetric solution of iodine, ... 101
Hospital steward, U S. A., circular relating to enlistment, ... 52
U. S. marine service, ... 452
Hydracetin, character and composition, ... 330
Hydrastine, reactions of (Vitali), ... 414
Hydrastis canadensis, use in vomiting of pregnancy, ... 515
Hydrogen peroxide, action upon metallic salts (Moerk), ... 123
Hyoscine identical with scopolamine, ... 373, 642
preparation and characters, ... 591
Hyoscyamine gold chloride, crystalline form of (Nagelvoort) 118
preparation, and characters of its salts, ... 588
Hypophosphite preparations, commercial, results of examination (Moerk), 393

Ichthyol, dose and effect, ... 224
use in small-pox, ... 235
Illinois College of Pharmacy, ... 279
Immunity and cure (Klemperer), ... 426
Infusion, digitalis, cause of gelatinizing, ... 569
hypodermic injections of, ... 608
process of preparation (England), ... 361
Inhalation in croup, ... 608
Ink, for writing upon glass or porcelain, formula for, ... 22
Intestinal canal, preparation for antisepsis of, ... 28
Iodine, absorption of moisture by, ... 523
method of determining water in (Meincke), ... 576
giving (England), ... 20
separation from bromine and chlorine (Schierholz), ... 574
solubility in chloroform (Duncan), ... 100
Iodo-eosine, indicator in alkaloidal assaying, ... 521
Iodoform, decomposition in collodion, ... 194
deodorizer for, ... 408, 571
estimation of (Richmond), ... 99, 174
injection, medicinal use of, ... 138
β-Iodonaphthol, a new aristol, ... 78
Ipecacuanha, criticisms of various assay methods, ... 519
value of unofficial parts (Hooper), ... 162
root, percentage of emetine, ... 568
Iron, action of nitric acid on, ... 618
sulphate, detection of copper sulphate in, ... 572

Jaborandi, from different localities, quality, ... 248
Jaenicke, Dr. Boric acid and a new boric preparation, ... 97
Jalap, method of assay (Alcock), ... 533
Jalapin, constituents of, ... 465
Jambul, influence on diastatic ferments, ... 542
Jurubebin, origin of, ... 645

Kaercher, H. F. Eupatorium perfoliatum, ... 510
Sodium benzoate, ... 185
Kamala, constituents of, ... 310
percentage of ash, ... 410
Kansas State University, School of Pharmacy, ... 388
Kiliani, H. Digitalin, ... 415
Kleinstuber, Wm. G. Calx sulphurata and potassa sulphurata, ... 186
Klemperer, Dr. Immunity and cure, ... 426

Kobert, R. and N. Kruskal. Agrostemma Githago, ... 320
Koefoed, Emil. Research on the acids of butter, ... 582
Kola nut, constituents of, ... 568
constitution of red coloring matter, ... 191
physiological action of, ... 79, 191, 230, 367
Kolanin, glucoside, from red coloring matter of kola nut, ... 191
Koumiss and compounds, preparation of (Davies), ... 629
Kruskal, N. and R. Kobert. Agrostemma Githago, ... 320
Kurfürst, C. and A. Ehrenberg. Aconitine, ... 637

Lard, detection of vegetable oils in, ... 84
Lead, detection in presence of copper and iron (Teed), ... 474
poisoning from wall-paper, ... 137
chromate, method of analysis, ... 366
Leaves, method of extracting constituents, ... 469
Lehmann, O. Artificial coloring of crystals, ... 321
Lepidium sativum, presence of salt, ... 366
Lettuce, presence of mydriatic alkaloid (Dymond), ... 46
Liatris spicata, analysis of rhizome, ... 603
Liebermann, C. An alkaloid of Java coca-leaves, ... 44
Limonene, a constituent of volatile oils, ... 623
Liniment, soap, process of preparation, ... 597
Liniment tar, formula for, ... 189
Liquids and gases, general law applicable to, ... 236
method of dispensing in capsules (Meyer), ... 17
Liquor. (See Solution.)
Lithium salts, purity of commercial, ... 540
Liver, chemistry of (Luff), ... 322
Lloyd, C. G. Cultivation of coffee in Jamaica, ... 396
J. U. Assay of alkaloidal preparations (fluid extract nux vomica), . . 337
Lolium temulentum, constituents of, ... 611
Losophan, preparation and uses of, ... 610
Lowe, C. B. Conveniences in the pharmacy, ... 14
On the medical uses of compressed gases, ... 601
Luckow, C. Estimations by means of potassium ferro- and ferricyanide, . 577
Luff, A. P. Chemistry of the liver, ... 322
Lyons, F. F. Sambucus canadensis, ... 1

Mafat, F. E. Plants capable of yielding tanning material, ... 526
Magnesium acetate, basic, as deodorizing agent, ... 371
sulphate, fatal poisoning by, ... 288
Maisch, J. M. Polygala alba, ... 177
Soda mint, ... 189
Vanilla plant an epiphyte, ... 555
Maize, proteids of (Chittenden and Osborne), ... 428
Mangold, C. Analysis of beeswax, ... 532
Manwaring, M. B. Pepsin assay, ... 505
Maranta arundinacea, crop of, in Bermuda, ... 171
Martin, Jas. H. Gymnocladus canadensis, ... 557
Maryland College of Pharmacy, ... 278
Massachusetts College of Pharmacy, ... 219, 388
Materia medica and geography, relation of (Holmes), ... 242
McFarland, R. M. Verbena urticæfolia, ... 401
McLeod, H. On the iodides of sulphur, ... 573
Medicago sativa, constituents of leaves, ... 470
Meincke, Prof. A simple method of determining the water in iodine, . . 576
Menthol preparations, for use in skin diseases, ... 469
reactions and character (Berkenheim), ... 491
Menyanthin from Menyanthes trifoliata, ... 310
Mercuric oxide, influence of temperature in preparation, ... 566

Mercuro-ammonium salts, characters of, ... 305
Mercury, vesication with, ... 191
volumetric determination of (Namias), ... 476
pyroborate, preparation and use, ... 141
Metals, action of nitric acid (Montemartini), ... 618
Methylene-blue, property of, ... 229
Meyer, C. Carroll. Dispensing liquids in capsules, ... 17
Micro-organisms in pharmaceutical preparations, ... 85
Microphotographs of authentic drugs, exhibited, ... 596
Microscope, practical use in pharmacy, ... 451
Microscopical preparations, simple method of drawing (Smith), ... 320
Milk, artificial, human (Clague), ... 203
human, constituents of, ... 28
in artificial alimentation of infants, ... 469
lanolin, formula for, ... 464
Mistura glycyrrhizæ composita, process of making (Stephen), ... 563
Mixture, antiseptic, Cavazzini's, ... 607
Moerk, F. X. Action of hydrogen peroxide upon metallic salts, ... 123
Examination of commercial hypophosphite preparations, ... 393
Gleanings from German journals, ... 22, 79, 139, 189, 232, 305, 368, 406, 459, 518, 563, 608
Laudanum assay, ... 354
Mörner, C. F. Behavior of gallic and tannic acids in the organism, . . 438
Moissan, H. Amorphous boron, ... 616
Monochorphenol, antiseptic properties, ... 224
Montemartini, C. Action of nitric acid on metals, ... 618
Morphine, amount present in opium, ... 135
antidote for, ... 135
Musk, artificial, various compounds (Baur), ... 31
Mosula japonica, constituents of, ... 523
Myrica asplenifolia, properties and constituents, ... 121, 303
Myrosin, character of, ... 233
Myrrholin, use of, ... 523
Myrtol, medicinal use and characters, ... 315

Nagelvoort, J. B. Crystalline form of hyoscyamine gold chloride, . . . 118
Namias, Rod. Volumetric determination of mercury, ... 476
Naphthalin, use as a tænifuge, ... 138
vapors, use in whooping-cough, ... 79
Naphthol (*a*), distinction from β-naphthol (Richardson), ... 161
Naphtholbenzoate. (See Benzonaphthol.)
Narcotine, amount present in opium, ... 135
National College of Pharmacy, ... 388
Nehring, P., and H. Beckurts. Angustura bark, ... 410
Nettle as a galactagogue, ... 604
New York College of Pharmacy, ... 279
Nickel, action of nitric acid on, ... 618
recognition of, in presence of cobalt, ... 607
Nitro-antipyrine, preparation of, ... 366
Nitrogen, flame of burning (Crookes), ... 441
Nitroglycerin, use in asphyxia of drowning, ... 182
Nitro-jute, manufacture and characters, ... 143
Nutmeg cultivation in Jamaica, ... 260
useful varieties of (Warburg), ... 435
Nux vomica, from different localities, quality, ... 249

Obituaries.—Arnold, Claude H., . 336 Boyle, W. H., ... 222
Bedford, P. W., . . 455 Brown, A. P., ... 287
Bell, Jas. S., ... 504 Campbell, Samuel, ... 223
Blomer, A. P., . . . 288 Dankwortt, Wilhelm, ... 176

Obituaries.—Dymock, Wm., . . 392
Formad, Henry F., . 392
Frisby, Frank, . . . 176
Hills, Thos. H., . . 111
Hofmann, A. W. v., 335
Kalteyer, Moritz, . . 336
Kannal, Emmett, . . 111
Knight, Wm. E., . . 504
Kopp, Prof. H,. . . 222
McCarthy, C. J., . . 288
Pancoast, Geo. W., 392
Passmore, F., . . . 111
Pengra, Chas. P., ... 176
Podwissotzky, V. O., ... 504
Redwood, Theophilus, ... 223
Sanford, Geo. W., ... 392
Schorlemmer, Carl, ... 600
Simes, Wm. F., ... 336
Stas, Jean S., ... 111
Street, Leonidas H., ... 111
Taylor, Harry B., ... 111
Turnpenny, Jos. C., ... 455
Watson, Sereno, ... 335

Oil, Abies species contains borneol acetate, ... 613
Allium Cepa, yield and constituents, ... 612
sativum, properties, yield, etc., ... 612
bergamot, oxygenated constituents of, ... 305
bitter almond, distinction of natural from artificial, ... 194
castor, sweetened, preparation of, ... 143
cloves, estimation of eugenol in (De la Cour), ... 508
method of assay, ... 26
cod-liver, adulteration of, ... 235
arsenical, preparation and dose, ... 83
corrective for, ... 473
exhibition of, ... 136
ferrated, formula and preparation, ... 78
medicated, processes of preparation, ... 233, 234
disinfection, composition of, ... 368
lavender, oxygenated constituents of, ... 306
lemon, concentrated taste and odor, ... 545
detection in oil of turpentine, ... 403
linden-seeds, constituents of, ... 138
linseed, presence of resin oil, ... 405
maize, characters and saponification of (Smith), ... 433
Mentha Pulegium, constituents of, ... 367
mullein, preparation of so-called, ... 3
olive, quality of commercial, ... 468
peppermint, Russian, constituents of, ... 409
petitgrain, oxygenated constituents of, ... 305
resin, presence in linseed oil, ... 405
rose, detection of geranium oil, ... 569
rosin, detection in fatty and mineral oils (Gritner), ... 376
santalwood, adulteration of, ... 569
sesame, test for, ... 564
theobroma, variation in melting point, ... 544
tumenol, preparation of, ... 81
turpentine, detection, in volatile oils, ... 228
in lemon oil, ... 403
reaction with manganous salts, ... 30
valerian, composition of, ... 233
wintergreen, volumetric assay of, ... 450
Oils, revision of constants employed in analysis of (Thomson and Ballantyne), ... 377
essential oxygenated constituents, ... 305
presence of metals, ... 81
resinified, purification of, ... 139
sesquiterpenes of, preparation and characters, ... 621
fixed, tests for identification of, ... 139
iodine-absorption of, ... 79, 407
vegetable, detection in lard, ... 84
Ointments. (See Skin varnishes and Unguentum.)

Oleoresins, suitable menstruum for (Beringer), ... 145
Opium, amount of morphine and narcotine present, ... 135
Oranges, blood, sophistication of, ... 405
Osborne, T. B. and R. H. Chittenden. Proteids of maize, ... 428
Ox gall, crystallized, preparation of, ... 570
Oxychinaseptol, properties of, ... 374, 464
Oxygen, generation by plants, ... 30
medicinal application (England), ... 11
Ozone, as a therapeutic agent, ... 466

Paal, C. Peptone salts from glutin, ... 478
Pancreatic liquid, action on decomposition of salol, ... 404
Paper, test, sensitive, preparation of, ... 192
Paracresylol, synthetic, characters of, ... 195
Paraffin, iodized liquid, prevention of precipitation, ... 316
Paraldehyde, effect of large dose, ... 206
Pareira Brava, from different localities, quality, ... 249
spurious, microscopical character (Holmes), ... 250
true and commercial, characters of (Ringer and Brooke), ... 255
Parsley, isolation of cariol, ... 516
Passmore, F. W. and H. Helbing. Analysis of coal tar preparations, . . 484
and Prof. Dunstan. Formation of aconine and conversion into aconitine, ... 209
Pasta guarana, method of assay, ... 524
naphtholi, formula for, ... 189
oleosa zinci, formula for, ... 189
resorcini fortior, formula for, ... 189
mitis, formula for, ... 189
salicylica, formula for, ... 189
Paullinia seeds, assay of (Thoms), ... 524
Peacock, J. C. Chimaphila umbellata and C. maculata, ... 295
Myrica asplenifolia, ... 303
Pekelharing, C. A. Coagulation of the blood, ... 201
Pellitory root, false, distinction from pellitory (Holmes), ... 90
Penghawar-djambi, property and use, ... 230
Pentaclethra macrophylla, oil from the seeds, ... 647
Pepsin, manufacture of (Shinn), ... 561
process of assay (Manwaring), ... 505
Peptone salts, from glutin (Paal), ... 478
Peptones, analysis of (Heaton and Vasey), ... 153
commercial, constituents of, ... 138
Percolation, economic, construction of apparatus, ... 449
Perdrix, L. A bacterium which ferments starch and produces amyl alcohol, ... 152
Petroleum, found in Peru, ... 514
Pharmaceutical Congress, Seventh International, ... 106, 208
education, ... 452
Pharmacists, Columbian World's Congress of, ... 106
Pharmacopœia, U. S., botanical names, ... 450
Pharmacy Board of Pennsylvania, ... 107, 388, 390, 500
Boards, examinations by (Remington), ... 355
business aspects of (Harrop), ... 74
conveniences in the (Lowe), ... 14
extension of college course, ... 452
law, Pennsylvania, amendment, ... 331
teaching to medical students, ... 452
Phenacetin derivatives, action of (Aronsen), ... 103
influence upon tests for quinine, ... 313
Phenetol carbamide or dulcine, ... 611
Phenol and bromides, use in whooping-cough, ... 517

Phenol, estimation by means of nitric acid, ... 29
Phenosalyl, preparation and character, ... 571
Phenyl salicylate. (See Salol.)
Philadelphia College of Pharmacy :
Alumni Association, ... 279
Classes of 1891–92, ... 54, 59
Commencement, ... 277
Examinations, ... 263
Graduates, ... 272
Minutes of meetings, ... 262
New college building, ... 281, 547
Pharmaceutical meetings, ... 50, 104, 170, 216, 329, 595, 644
Social reunion, ... 51
Phloroglucin, estimation in plants, ... 515
Phlox subulata, constituents of, ... 121
Phosphorus, antidote to poisoning by, ... 648
black, nature of, ... 371
Picrasma eilantoides, constituents of, ... 523
Pill coating with salol, ... 28
Pills, anæmia, formula for, ... 171
creasote, excipient for (Roberts) 6
formula for, ... 189
preparation, ... 462
Niemeyer's, formula for, ... 171
phthisis, formula for, ... 171
salol-coated, preparation of, ... 518
Pillyanine, alkaloid from Lycopodium saururus, ... 522
Pilocarpine, effect upon milk, ... 231
Piperazine, constitution, use and dose, ... 112
Pittsburgh College of Pharmacy, ... 279
Plant press, construction of, ... 329
Plants, alliaceous and products (Simmonds), ... 328, 380
capable of yielding tanning material (Mafat), ... 526
Japanese, constituents of, ... 523
Podophyllum Emodi, yield of resin, ... 542
Polygala alba, frequency of, ... 180, 386
occurrence in Kansas (Sayre), ... 553
source of false senega (Maisch), ... 177
Populus alba, constituents of bark (Schaak), ... 226
Potash, American, quality of, ... 449
Potassa sulphurata, results of examinations (Kaercher), ... 186
Potassium bromide, tests for, ... 542
dichromate, medicinal use and dose, ... 552
ferro and ferri cyanides, separations and estimations by means of, . . 577
oxalate, acid, poisoning by, ... 231
permanganate, antidote to phosphorus poisoning, ... 648
Powder, insect, constituents of, ... 408
tooth, red coloring matter, ... 22
saponaceous, formula, ... 189
Powders, goa, commercial, history, characters, etc. (Duncan and Tweedie), 93
Power, F. B., leaves Wisconsin University, ... 218
Preparations, official, examination of some (Trimble), ... 183
pharmaceutical, formulas for (Beringer), ... 4
Prescription files, various constructions, ... 218
Proprietary medicines, evils of, ... 387
Prunus Laurocerasus, constituents of fruit, ... 467
Puleone, constituent of oil of Mentha Pulegium, ... 367
Puleonoxime, constituent of oil of Mentha Pulegium, ... 367
Purdue University School of Pharmacy, ... 279
Purgatives, influence on bile, ... 288

Purshia tridentata, constituents of seeds (Trimble), ... 69
Pyrogallol, preparation of (Cazeneuve), ... 604
Pyroxylin, denitration of (Woodman), ... 481

Quickine, use and constituents, ... 139
Quinethyline, method of preparation, ... 78
Quinine, estimation of, in cinchona bark, ... 608
influence of phenacetin upon tests for, ... 313
phosphate, composition of, ... 544
sulphate, preparation of light (ammonium sulphate), ... 314
tannate, method of preparation, ... 142

Raphanus sativus, presence of salt, ... 366
Reid, V. I. Analysis of trillium, ... 67
Remedies, proprietary, filling of prescriptions for, ... 646
Remington, Jos. P. Examinations by Boards of pharmacy, ... 355
Fluid extracts of erythroxylon and cinchona, ... 458
Preparation of glycerin suppositories, ... 457
Resin, detection in dammar, ... 613
Resins, medicinal, solutions of, ... 633
REVIEWS.—Adams, J. H. Account of the Influenza, ... 220
All around the year, 1893, ... 646
Allyre, C. Sur quelques nouveaux chlorures doubles, ... 648
Bahadur, M. S. K. Materia Medica of Madras, ... 285
Beasley, H. The book of prescriptions, ... 221
Berthelot, P. A. D. La neutralisation des acides et des bases, ... 503
Biltz, Ernst. Schutz des Chloroforms vor Zersetzung am Licht, . . 391
Zersetzbarkeit des Chloroforms, ... 647
Bocquillon-Limousin, H. Formulaire de l'antisepsie et de la désinfection, ... 647
Formulaire des médicaments nouvelles, ... 334
Bremer, L. Tobacco. insanity and nervousness, ... 220
Brestowski, A. Handwörterbuch der Pharmacie, ... 332
Cannizzaro, S. and G. Fabris. Examination as to the Reliability of Certain Tests, ... 109
Cathell, D. W. On the Physician himself, ... 502
Contributions from the U. S. National Herbarium, ... 646
Coulter, J. M. Phanerogams and Pteridophytes of Western Texas, . 389
Davis, N. S. Diseases of Lungs, Heart and Kidneys, ... 600
Demont, L. L'Étude chimique du Chloroforme, ... 503
Denison, Chas. Tuberculin, ... 220
Tuberculin and the living cell, ... 648
Denton, Jas. M. Experiments and researches on trap syphonage, . . 110
Dohme, A. New Series of Reactions for Alkaloids, ... 552
Domergue, Albert. Les teintures alcooliques de la Pharmacopée Française, ... 551
Dymock, Wm. Pharmacographia Indica, ... 283
Education of Business Men, ... 549
Eggert, Henry. Catalogue of phænogamous and vascular cryptogamous plants near St. Louis, ... 110
Engelmann, Geo. J. Medical Education and Legislatiou, ... 552
Fabris, G. and S. Cannizzaro. Examination as to the Reliability of Certain Tests, ... 109
Feestnummer der Berichten van de Nederlandsche Maatschappij der Pharmacie, ... 501
Foster, Frank P. Illustrated Encyclopædic Medical Dictionary, . . 550
Gaillard, A. Le genre Meliola, ... 283
Gerard, E. Quelques corps gras d'origine végétal, ... 503
Greshoff, M. Planten en Plantenstoffen, ... 503
Hallberg, C. S. Pharmacal Calendar for 1892, ... 333

REVIEWS.—Heckel, E. Résistance des Animaux à l'action de certains poisons, . . . 598
Sur la graine d'owala, . . . 647
Sur le dadi-go ou balancounfa, . . . 647
and F. Schlagdenhauffen. Sur deux plantes alimentaires coloniales, . . . 598
Heebner, Chas. F. Pharmacy and Pharmaceutical Chemistry, . . . 389
Helbing, H. Modern Materia Medica, . . . 598
Hesse, O Uber Sulphonsäuren einiger Chinaalkaloide, . . . 551
Zur Kenntniss der Cocablätter, . . . 551
Hilger, A. Mitteilungen aus dem pharmaceutischen Institut, Universität Erlangen, . . . 548
Hoffmann, Fr. Popular German Names of Domestic Drugs and Medicines, . . . 501
Hugounenq, L. J. Recherches sur les vins, . . . 503
Huidekoper, R. S. Age of Domestic Animals, . . . 108
Holmes, E. M. Catalogue of Hanbury Herbarium, . . . 391
Hunt, Wm. Address upon Joseph Leidy, . . . 391
Husemann, Theodor. Handbuch der Arzneimittellehre, . . . 174
Jahrbuch der Chemie, . . . 388
Jahresbericht, 1891, . . . 548
Kaviratna, A. C. Charaka-Samhita, . . . 286
Kremers, Ed. On Citronellone, . . . 504
The Limonene group of terpenes, . . . 504
and F. A. Sieker. Menthene, . . . 504
Lefèvre, J. Sur la puissance et le grossissement de la loupe et de la microscope, . . . 648
Lloyd, J. U. Elixirs and flavoring extracts, . . . 221
Luff, A. P. A Manual of Chemistry, . . . 548
Maisch, J. M. A Manual of Organic Materia Medica, . . . 501
Martindale, Wm. Coca and cocaine, . . . 390
The Extra Pharmacopœia, . . . 502
Massachusetts Agricultural Experiment Station, . . . 391
Merck, E. Jahresbericht, . . . 220
Minutes of the meeting of the American Pharmaceutical Association, 648
Myers, H. C. Ueber Dichlormethylparaconsäure, . . . 220
Oldberg, O. 1,500 Prescriptions of all Kinds, . . . 599
Pharmaceutical and Chemical Problems and Exercises, . . . 550
Over one thousand prescriptions, . . . 647
Perrot, E. L'Étude histologique des lauracées, . . . 503
Pharmaceutical Review, edited by Chas. Caspari, Jr., . . . 219
Planchon, Louis. Les Aristoloches, . . . 175
Poulenc, C. Le pentafluochlorure de phosphore, . . . 503
Prescott, A. B. Address on the work in chemical science, . . . 648
Proceedings of the American Pharmaceutical Association, . . . 107
Association of Official Agricultural Chemists, . . . 287
National Confectioners' Association, . . . 552
Wholesale Druggists' Association, . . . 110
Reagents and volumetric solutions for the U. S. Pharmacopœia, . . . 389
Reber, B. Gallerie hervorragender Therapeutiker und Pharmacognosten, . . . 597
Remondino, P. C. Mediterranean shores of America, . . . 283
Remsen, Ira. Principles of Theoretical Chemistry, . . . 549
Report of Massachusetts Board of Registration in Pharmacy, . . . 220
Pharmaceutical Society of Australasia (35th annual), . . . 391
Postmaster-General of the United States, . . . 110
Reuter, L. Die Isomeration höherer Homologen, . . . 503
Riley, C. V. Yucca moth and Yucca pollination, . . . 503
Robinson, B. General *vs.* local treatment of catarrhal inflammations, 220
Rohé, Geo. H. Diseases of the skin, . . . 286

REVIEWS.—Roussel, J. B. J. Le chloral et ses dérivés, ... 648
Ruschenberger, W. S. W. Sketch of Life of Joseph Leidy, ... 391
Sadtler, S. P. and H. Trimble. A text-book of chemistry, ... 598
Saunders, Wm. Experimental Farms, ... 502
Production and manufacture of beet sugar, ... 287
Schlagdenhauffen, F. and E. Heckel. Sur deux plantes alimentaires coloniales, ... 598
Sewall, J. A. Grass and Forage. Experiment Station, ... 390
Sieker, F. A. and Ed. Kremers. Menthene, ... 504
Small, John K. Mosses of Lancaster County, Pa., ... 282
Tracy, S. M. Co-operative branch stations in the South, ... 390
Transactions, Academy of Science of St. Louis, ... 390
Trelease, Wm. The Species of Rumex, ... 334
Yucca and Agave Engelmanni, ... 503
Tremeau, G. C. E. Le Développement de la Casse et du Tamarin, . 600
Trimble, H. Practical and analytical Chemistry, ... 219
The Tannins, ... 108
and S. P. Sadtler. A text-book of chemistry, ... 598
Vasey, G. Grasses of the Pacific Slope, ... 646
Grasses of the Southwest, ... 110
United States and British America, ... 282
Warner, L. F. Materia Medica and Therapeutics, ... 551
Warner, W. R. Therapeutic Reference Book for Physicians, ... 552
Webber, H. J. Appendix to the Catalogue on the Flora of Nebraska, 552
Wedderburn, A. J. Report on Food Adulterations, ... 390
Wiley, H. W. Experiments with sorghum, ... 390
Sugar Beets, ... 552
Foods and Food adulterants, ... 390, 551
Williams, Thos. A. Fruiting of Parmelia molliuscula, ... 503
Wills Eye Hospital, report of, ... 549
Year-book of Pharmacy, ... 107
Zoölogical Society of Philadelphia, twentieth annual Report, . . . 549
Richardson, F. W. Method of distinguishing alpha- and β-naphthol, . . 161
Richmond, H. D. Estimation of iodoform, ... 99
Ringer, F. A. and E. Brooke. True and commercial pareira, ... 255
Roberts, Jos. C. Creasote pills, ... 6
Rüdel, C. Alkaloids of Berberis aquifolium and B. vulgaris, ... 379

Saccharum lactis, process of preparation, ... 386
Saint Louis College of Pharmacy, ... 278, 281
Salol, camphorated, preparation and use, ... 194
decomposition of, by pancreatic liquid, ... 404
formulas for exhibition of, ... 29
preparation of, ... 142, 570
reaction of (nitrosulphuric acid), ... 77
vaselin, preparation and use of, ... 521
Salophen, characters and dose, ... 84
Sambucus canadensis, description, properties and constituents of flowers, (Lyons), ... 1
Santonin, medicinal use and dose, ... 475
Santoninoxime, as an anthelmintic, ... 193
Saprol, composition of, ... 368
Sarsaparilla, constituents of, ... 465
Sawyer, J. Ether as a menstruum in medication by the skin, ... 624
Sayre, L. E. Northern senega, ... 113
Polygala alba, ... 553
Scammony resin, characters of commercial (Umstead), ... 122
Schaak, M. F. Bark of Populus alba, ... 226
Schaap, Miss J. Separation of salicylic from benzoic acid, ... 442
Schaer, Edward, Flückiger's successor, ... 500

Schierholz, C. S. Separation of iodine, bromine and chlorine, ... 574
Scopolamine, composition and properties, ... 641
identical with hyoscine, ... 373
Senega, northern, description, etc. (Sayre), ... 113
Senna, Aden, source of, ... 386
Alexandria, commercial, changes in character of, ... 105
Sesquiterpenes, properties and reactions, ... 620
Shamel, C. H. Eupatorin, principle of Eupatorium perfoliatum, ... 511
Shaw, F. C. Eupatorium rotundifolium, ... 225
Shinn, Jas. T. Extract of beef and pepsin, ... 561
Silk, method for distinguishing vegetable fibres, ... 316
nitrated, preparation and characters (Vignon and Sisley), ... 586
Simmonds, P. L. Alliaceous plants and their prodncts, ... 328, 380
Sisley, P. and L. Vignon. Nitrated silk, ... 586
Skin varnishes, medicated, ... 199
Smith, A. H. Method of drawing microscopical preparations, ... 320
Smith, J. C. Maize oil, ... 433
Smythe, W. J. False angustura bark, ... 115
Snuff, for hay fever, formula, ... 119
Soaps, medicinal, various, use of, ... 25
mercurial, preparation of, ... 459
tooth, formulas for, ... 463
Soda mint, substitution of spearmint for peppermint (Haussmann), . . . 187
Sodium, preservation of, ... 233
and chloride of gold, medicinal use and dose, ... 466
benzoate, preparation by crystallization (Kaercher), ... 185
bicarbonate, reaction with borax in glycerin, ... 451
ethylate, preparation and use, ... 571
hypobromite, action upon glass, ... 313
salicylate, adulteration of, ... 370
thiophene-sulphonate, character and use, ... 190
thiophene-sulphonate, medicinal use, ... 315
Solanaceous bases, preparation and character (Hesse), ... 587, 641
Solanum species, called jurubeba, ... 645
Solution, rapid method of, in the cold (Coleman), ... 375
bimeconate of morphine, constituents, ... 450
bismuth chloride, preparation of, ... 137
boric acid, concentrated, preparation of, ... 365
chloride of iron, result of assay, ... 184
chlorinated soda, per cent. of chlorine, ... 184
chlorinated soda, preparation of, ... 313
coal tar, formulas for, ... 5
Dobell's, reactions in making, ... 330
four chlorides, formula for, ... 5
iodine, standardization of (Hoseason), ... 101
Labarraque's, determination of alkalinity, ... 407
lead subacetate, substitute for, ... 371
oxalic acid, stability of, ... 566
potassium arsenite, coloring matter suggested, ... 232
potassium permanganate, stability of, ... 565
sodium salicylate, concentrated, action of, ... 235
sodium thiosulphate, stability of, ... 566
strontium iodide, formula for, ... 517
strontium lactate, formula for, ... 307, 517
thiosulphate, standardization of, ... 80
Solutions, aseptic and antiseptic, formulas for, ... 386
camphor, for hypodermic injections, ... 228
medicinal resins, preparation of (Wyatt), ... 633
percentages in (England), ... 72
volumetric stability of, ... 565

Solutol, composition and use, ... 81
Sorbus Aria, use of fruit, ... 403
Sozal. (See Aluminium paraphenol-sulphonate.)
Specialties in prescriptions, ... 646
Spices, selection and characters of (Heinitsh), ... 357
Spiræa Ulmaria, constituents of, ... 306
Spirit, ammonia, aromatic, prevention of precipitate, ... 449
Sponges, iodoform, preparation of, ... 22
Stahl, J. Molybdic acid, a color reagent for aromatic oxycompounds, . . 439
Starch, digestibility of, ... 539
fermentation by a bacterium (Perdrix), ... 152
Starches, commercial, process of analysis, ... 192
State Pharmaceutical Associations:

Alabama, ... 382, 500
Arkansas, ... 498
California, ... 220
Colorado, ... 498
Delaware, ... 382
Florida, ... 382
Georgia, ... 383, 500
Illinois, ... 221
Indiana, ... 221, 383
Iowa, ... 109, 498
Kansas, ... 383
Kentucky, ... 383, 547
Louisiana, ... 383
Maine, ... 384
Massachusetts, ... 546
Michigan, ... 499
Minnesota, ... 109, 499
Mississippi, ... 384
Missouri, ... 499
Montana, ... 499
Nebraska, ... 384
New Hampshire, ... 109, 546
New Jersey, ... 384
New York, ... 499
North Carolina, ... 110, 499
North Dakota, ... 391, 546
Ohio, ... 221, 384, 391
Pennsylvania, ... 384, 547
South Dakota, ... 547
Tennessee, ... 387
Texas, ... 387
Utah, ... 387
Washington, ... 387
Wisconsin, ... 500
Quebec, ... 547

Stead, J. C. Reactions of cocaine, ... 317
Stephen, W. L. Mistura glycyrrhizæ composita, ... 563
Strontium bromide, dose and use of, ... 136
elimination of, ... 605
chloride, crystallization of, at different temperatures, ... 312
lactate, preparation and use of, ... 136
phosphates, preparation and composition of, ... 605
salts, as tænifuges, ... 191
effects and medical uses, ... 605
pharmaceutical preparations, ... 466, 516
test for absence of barium, ... 313
tests for purity of, ... 136
Strophanthus, from different localities, quality, ... 249
Strouse, Theo. H. Elixir of yerba santa, ... 6
Strychnine and brucine, separation of, ... 449
formation of strychnic and isostrychnic acids (Tafel), ... 41
poisoning, use of the electro-magnetic current, ... 540
presence in the brain, ... 572
salts, suitability for pharmaceutical purposes, ... 541
Sublimate, injections, in blennorrhagic rheumatism, ... 232
Sugar, estimation in wines (Vogel), ... 95
grape, method of estimation, ... 542
test for, in urine, ... 524
Sulphaminol, action of, ... 135
Sulphates, anhydrous, crystallized, preparation, ... 466
Sulphur, solubility in alcohol, ... 369
iodides, preparation and characters (McLeod), ... 573
Suppositories, glycerin, preparation of, ... 134, 368, 457

Syndetikon, preparation of, ... 409
Syrup, apparatus for preparing, ... 596
benzoin, process of preparation, ... 134
calcium lactophosphate, results of analysis, ... 451
codeine, distinction from syrup of morphine, ... 571
ferrous iodide, reagent for ammonia, ... 408
glycyrrhiza, preparation and tests for, ... 565
iodide of iron, preservation of (Beck), ... 18
morphine, distinction from syrup of codeine, ... 571
phosphates of iron, quinine and strychnine, chemistry of elements of, 451
pomegranate bark, preparation of, ... 563
strontium bromide, formula for, ... 517

Tablets, compressed, and tablet triturates, preparation of (Hahn), ... 360
Tænifuge, formula for, ... 469
Tafel, J. Strychnine, ... 41
Tannin, estimation in wines (Vogel), ... 95
method of estimation, ... 436
reagent for, ... 77
yields benzoic acid, ... 79
Tar, coal, preparation, constituents, etc. (Helbing and Passmore), ... 484
Tar, lignite, constituents of oil (Heusler), ... 585
Taraxacum officinale, constituents of root, ... 65
root, yield of juice, ... 450
Tea, Chinese, method of examination (Dvorkovitch), ... 48
coffee-leaf, suggestion for, ... 88
determination of alkaloid, theine, ... 543
estimation of caffeine in, ... 468
flavoring of, ... 468
Teed, F. L. Detection of lead in presence of copper and iron, ... 474
Temuline, properties of, ... 611
Thilanin, method of preparation and use, ... 25
Thiophene biniodide, characters of, ... 315
Thiosinamine, preparation and medicinal use, ... 608
Thioxydiphenyldiamine. (See Sulphaminol.)
Thompson, H. L. Arrowroot plantations of Queensland, ... 631
Thomson, R. T. and H. Ballantyne. Revision of constants for fats and oils, ... 377
Thymacetin, formula and use, ... 139
Tincture, cinchona, process of, ... 544
chloride of iron, results of assay, ... 183
iodine, per cent. of iodine, ... 183
opium, assay of (Moerk), ... 354
Tri-iodo-meta-cresol, called losophan, ... 610
Trillium, analysis of (Reid), ... 67
Trimble, H. Examination of some official preparations, ... 183
Purshia tridentata, ... 69
Trimethylamine, effect of, ... 229
Tropacocaine. (See Benzoyl-pseudotropeine.)
Tuberculin, purification of, ... 24
Tumenol preparations, new dermal remedies, ... 81
Tweedie, T. S. and W. Duncan. Commercial goa powders, ... 93
Typhoid fever, value of Ehrlich's urine test for (Beringer), ... 559

Umney, J. C. African copaiba, "so-called," 33
and Prof. Dunstan. Alkaloids of true Aconitum Napellus, . . . 207
Umstead, W. H. Commercial resin of scammony, ... 122
Unguentum boroglycerini, formula for, ... 6
contra perniones, formula, ... 189
diachylon carbolisatum, formula for, ... 189

Unguentum hydrargyri oxidi, cause and prevention of lumpiness, ... 541
myrrhæ, preparation and use, ... 523
rubrum sulfuris, formula for, ... 189
Urea, estimation of, ... 614
Urine, examination for sugar, ... 140
icteric, examination for albumin, ... 316

Vaccinium Vitis-idæa, use in rheumatism, ... 515
Valeriana officinalis, constituents of root, ... 523
Vanilla planifolia, comparison with another species of vanilla, ... 171
plant, epiphytic character of, ... 554
Vanillas, commercial, characters and consumption of (Beringer), ... 289
Varnishes, skin, medicated, ... 199
Vaselin, estimation of fats in, ... 27
salol, formula and use, ... 521
Vasey, S. A. and C. W. Heaton. Analysis of peptone, ... 153
Veratrine, test for, ... 375
Veratrum album, from different localities, quality, ... 250
Verbena urticæfolia, chemical examination of root (McFarland), ... 401
Vignon, L. and P. Sisley. Nitrated silk, ... 586
Vine, coloring matters of (Gautier), ... 626
Vitali, D. Reactions of hydrastine and other alkaloids, ... 414
Vitis vinifera, constituents of leaves, ... 470
Vogel, J. H. Estimation of sugar and tannin in wines, ... 95

Wanklyn, J. A. General law applicable to gases and liquids, ... 236
Warburg, Dr. The useful varieties of nutmegs, ... 435
Wash, tooth, antiseptic, formula for, ... 464
formula for, ... 464
Water, action on glass (Mylius and Forrester), ... 472
chlorine, assay of, ... 307
mint, distilled, colored vegetation in, ... 571
potable, presence and estimation of organic matter (Young), ... 471
tar, distilled, medicinal use, ... 365
Waters, distilled medicinal, coloring matter in, ... 470
mineral, of Japan, analysis of, ... 518
Wax, tooth, formula for, ... 464
Waxes, Italian yellow, results of analysis (Camilla), ... 196
White, E. Thyroid extract: its preparation, ... 634
Wines, estimation of sugar and tannin in (Vogel), ... 95
Winter and Hayens. Chemistry of digestion and of gastric juice, ... 241
Winterstein, E. Vegetable amyloid, ... 483
Woodman, D. Denitration of pyroxylin, ... 481
Wool, method for distinguishing vegetable fibres in, ... 316
Wyatt, Harold, Jr. Solutions of medicinal resins, ... 633

Xanthine, physiological action of, ... 231
Xanthoxylum, development of corky spines, ... 525

Young, W. C. Presence and estimation of organic matters in water, . . 471

Zinc, action of nitric acid on, ... 618
valerianate, characters of commercial, ... 540
Zuco, F. Marino. Alkaloid from chrysanthemum flowers, ... 163

GLENN'S SULPHUR SOAP

GLENN'S SULPHUR SOAP is the *original* and *best* combination of its kind, and the one now generally in use. For sale by all druggists.

BEWARE OF COUNTERFEITS.

WHOLESALE DEPOT:

The Charles N. Crittenton Co.

115 Fulton Street, *NEW YORK.*

THERE IS NO LINE OF

POWDERED DRUGS

So Complete, so Reliable, or at Such Reasonable Prices, as

OUR EXTRA SELECT POWDERS.

FAC-SIMILE OF PACKAGE

ONE POUND STRICTLY PURE
POWDERED IPECAC ROOT.
Cephaelis Ipecacuanha.
carefully selected and garbled
Ipecac, 1 part; Po. Opium, 1 part; Po. Sugar of Milk, 8 parts.
Dovers Powder, 180 grs.; Po. Squill, Po. Ammoniac, each 60 grs.
Ipecac—Po. Ipecac, Po. Tragacanth, each 120 grs.; Sugar,
Dose—1 to 3. Bucklers Croup Mixture—Tartar Emetic, 2 grs.
every five minutes until it operates

OF OUR EXTRA SELECT POWDERS.

They are powdered from the choicest materials with the greatest care, labeled with the botanical, common, German and French names; also the medical properties and formulas for preparations in which the powders may be used. Are put up in sealed tin cans of one pound each, and

NEVER OBTAINABLE IN BULK.

ALLAIRE, WOODWARD & CO.

PEORIA, ILL.

ESTABLISHED 1822.

ROSENGARTEN & SONS,

Manufacturing Chemists,

PHILADELPHIA.

Sulphate of Quinine.

Muriate of Quinine.
Citrate of Iron and Quinine,
Sulphate of Cinchonine,
Sulphate of Cinchonidine,
Sulphate of Quinidine,
Bromide of Ammonium,
Bromide of Potassium,
Nitrate of Silver,
Aqua Ammonia.

Sulphate of Morphine.

Acetate of Morphine,
Muriate of Morphine.
Nitrate of Ammonia,
Hypophosphites,
Subnitrate of Bismuth,
Spirit of Nitre,
C. P. Acids,
Tannin,
Ether

And a General Assortment of Fine Chemicals.

Extract from Report of the Judges at the Exhibition of the Franklin Institute, Philadelphia, November, 1874, in regard to the Chemicals exhibited by Rosengarten & Sons:

"These gentlemen exhibit quite a list of Chemicals, and claim for them superior purity considered as commercial articles. The Committee have carefully examined a number of them and find this claim fully substantiated, some of the articles being almost absolutely Chemically Pure, and being certainly the best of the kind in the market.

"For Purity of Chemical Preparations, a Silver Medal."

F. A. GENTH, Prof. Chemistry, University Pa.
G. A. KOENIG, Prof. Chemistry, University Pa.
S. P. SADTLER, Prof. Chemistry, University Pa.
J. E. CARTER, Manufacturing Chemist.

BULLOCK & CRENSHAW,

WHOLESALE DRUGGISTS,

Manufacturers and Importers,

No. 528 ARCH STREET, - Philadelphia.

—OUR—

SUGAR-COATED PILLS AND GRANULES

Maintain their high reputation for Reliability, Solubility and Perfection in Finish.

LABORATORY APPARATUS and PURE CHEMICALS

Are a specialty with us. Send for our Catalogues.

Rare Chemicals and Drugs, Superior Colognes, Extracts and Sachets, Strictly Pure Powdered Drugs and Essential Oils.

POWERS & WEIGHTMAN,

MANUFACTURING CHEMISTS,

PHILADELPHIA,

Holders of **FIRST MEDALS** from

WORLD, NATIONAL AND STATE EXPOSITIONS

BESTOWED FOR

PURITY AND PERFECTION OF THEIR MANUFACTURES,

WHICH EMBRACE

ACIDS,

SUCH AS ACETIC, CITRIC, TARTARIC, AND OTHERS.

CORROSIVE SUBLIMATE, RED AND WHITE PRECIPITATE, CALOMEL AND OTHER

MERCURIAL PREPARATIONS.

MORPHINE,

SULPHATE, MURIATE, ACETATE, ETC.

QUININE.

QUINIDINE, CINCHONINE, CINCHONIDINE,

IN ALL THEIR FORMS.

IN SHORT, A GENERAL ASSORTMENT OF

CHEMICALS,

MEDICINAL, PHOTOGRAPHIC AND FOR THE ARTS.

Sold only to Wholesale Druggists and others buying in similar quantities.

New York Office, No. 56 Maiden Lane.

When ordering, please specify "Powers & Weightman's" goods.

The PUREST and MOST ACTIVE PEPSIN
EVER INTRODUCED.

Webber-Pepsin, S. & D.

Standard

1 to 6000.

A Soluble, Non-Hygroscopic, Inodorous, Permanent Pepsin.

DOSE: ⅛ to 2 GRAINS.

The Webber-Pepsin will completely digest 6000 times its weight of coagulated egg-albumen in accordance with the conditions of the U. S. P. test or that of the National Formulary.

It is not a Peptone-Pepsin yet it is perfectly soluble, being free from mucus and inert putrescible matter, and is so palatable that the most fastidious patient will take it readily.

It is entirely free from septic contaminations, or other products of decomposition.

Physicians will appreciate these several advantages as possessed solely by the Webber-Pepsin.

Although further investigations based upon the Webber process have enabled us to produce Pepsin capable of digesting from 20,000 to 30,000 times its weight of coagulated egg-albumen, we have adopted 1 to 6000 as our standard for the Webber-Pepsin, because this already far exceeds the digestive power of any other pepsin yet introduced, and especially because the production of a Pepsin of a still higher digestive power disproportionately increases its cost.

Webber-Pepsin is offered in Granular form and in Scales, but unless otherwise specified we invariably furnish it in GRANULAR form.

℔ Price, $1.25 net per ounce. **Manufactured only by**

Branch Houses, SHARP & DOHME, Baltimore, Md., U.S.A.

New York and Chicago.

1837. ROBERT SHOEMAKER & CO. 1892.

N. E. Corner Fourth and Race Streets,

PHILADELPHIA.

MANUFACTURERS of **Strictly Pure Powdered Drugs** and **Spices.**

The best crude goods only are used, and each article, prepared in our own mills, with the most scrupulous care. Crushed, ground and finely powdered drugs to meet the requirements of the best educated, conscientious Pharmacist.

IMPORTERS of **Fine Drugs, Essential Oils, Aromatic Distilled Waters.**

NORWEGIAN COD-LIVER OIL.

OLIVE OIL, Finest quality.

CASTILE SOAP, and Italian Drugs.

ALLEN'S MEDICINAL EXTRACTS, WINES and JUICES of **Conium, Hyoscyamus,** Etc., Etc.

Sole United States Agents for **JOHNSTON'S FLUID BEEF.**

HUNTER'S SCOTCH OATMEAL.

New Combination TABLETS

AND ADDITIONAL SIZES

ANTIKAMNIA TABLETS

ONE · TWO · THREE · FIVE

AND TEN GRAINS EACH.

COMBINATION TABLETS. ANTIKAMNIA AND QUININE.

CONTAINING 2½ GR. EACH ANTIKAMNIA AND SULPH: QUININE.

ANTIKAMNIA AND SALOL.

CONTAINING 2½ GR. EACH ANTIKAMNIA AND SALOL

SAMPLES FREE. ANTIKAMNIA CHEMICAL CO., ST. LOUIS, MO., U. S. A.

LIQUID

RENNET

This article coagulates Milk without previous preparation, being most convenient for making

JUNKET, OR CURDS AND WHEY.

This Rennet, made from fresh Calves' Stomachs, is believed to be the best and cheapest in the market, and to give perfect satisfaction to dealers and consumers. Sold by the leading Wholesale Houses in Boston, New York and Philadelphia, and by the Manufacturer,

JAMES T. SHINN,

Apothecary,

Broad and Spruce Sts.

PHILAD'A.

Scientific American Agency for

PATENTS

CAVEATS, TRADE MARKS, DESIGN PATENTS COPYRIGHTS, etc.

For information and free Handbook write to MUNN & CO., 361 BROADW'Y, NEW YORK. Oldest bureau for securing patents in America. Every patent taken out by us is brought before the public by a notice given free of charge in the

Scientific American

Largest circulation of any scientific paper in the world. Splendidly illustrated. No intelligent man should be without it. Weekly, $3.00 a year; $1.50 six months. Address MUNN & CO., PUBLISHERS, 361 Broadway, New York.

Bullock & Crenshaw,

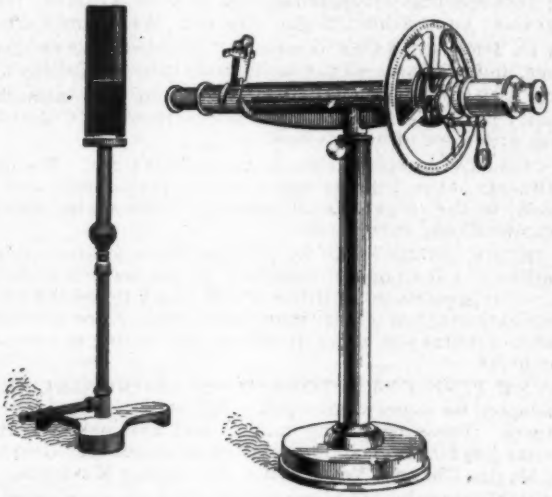
528 Arch Street, Philadelphia,

IMPORTERS AND DEALERS IN

Laboratory Supplies of the Finest Quality.

SWEDISH CUT FILTER PAPERS.

Chemicals.



Apparatus.

NEW PATENT POLARISCOPE, TWO SCALES, $75.00.

Descriptive Circulars Furnished on Application.

☞Catalogues will be mailed upon receipt of postage (5 cents).

Baker & Adamson's C. P. Acids.

Finest Bohemian Beakers and Flasks.

Agents for J. Bishop & Co.'s Superior Platinum Ware.

Agents for Chemicals of L. C. Marquart and Dr. Theo. Schuchardt.

PHARMACEUTICAL SPECIALTIES.

After the summer outing, with its frequently unsanitary accompaniments, a condition of general malaise and ennui ensues, which creates a special demand for tonics and anti-periodics. Among some serviceable products of this character we invite attention to the following:

Among the many methods of administering medicaments, the soluble Elastic Gelatine Capsule is growing to be one of the most popular.

Of EXTRA SIZED ELASTIC-FILLED GELATIN CAPSULES there are Castor Oil, 2½ to 15 grammes; Cod Liver Oil, 2½ to 15 grammes; Male Fern and Castor Oil; Santonin and Castor Oil.

EMULSION of COD LIVER OIL with HYPOPHOSPHITES is the perfection of an emulsion, pure, fluid, palatable. Each fluid ounce contains Cod Liver Oil, 4 fluid drachms; Hypophosphites of Lime, 8 grains; Hypophosphite of Soda, 4 grains; Gum Arabic, Sugar, Glycerin, Water and Carminatives.

ESENCIA DE CALISAYA is now well established as an agreeable stimulant febrifuge, and possesses all the medicinal virtues of Calisaya.

WILD'S SYRUP IRON CHLORIDE has met with instantaneous favor. It is an entirely palatable syrup of officinal Tincture Iron Chloride, combining all its virtues with none of its drawbacks.

COCA CORDIAL presents coca in a palatable form. The astringent and bitter constituents of the drug are rejected in its preparation, and it commends itself especially to the large class of persons of delicate nervous organization as a heart stimulant and invigorator.

BEEF JELLY will be found by pharmacists a most eligible product for making bouillon. A teaspoonful dissolved in hot water is sufficient for a cup of bouillon. It represents in nutritive value many times the strength of the ordinary beef extracts, and it is far more assimilable. For a restorative or winter drink, after a journey or drive, it affords the feeling of *bien content* which hot bouillon gives.

ANODYNE PINE EXPECTORANT and BRONCHIAL SEDATIVE are admirably adapted for expectorants and cough sedatives in bronchitis, and for cough mixtures. These are put up in pint and half gallon bottles. Among the newer remedies for cough and respiratory affections are: Grindelia Robusta, Quebracho, Myrtus Chekan, Yerba Santa, and Lippia Mexicana.

GLYCERIN suppositories of our manufacture are guaranteed to contain 95 per cent. glycerin. We put them up in convenient packages for dispensing, in bottles of ½ dozen and dozen.

RENNIN, the milk-curdling ferment, which is used largely in the preparation of junket (curds and whey), we supply in one grain tablets, capable of curdling one pint of milk.

We make a line of eligible antiseptics and disinfectants for internal and external use, including Eucalyptus and Thymol Antiseptic, Copper Arsenite Tablet Triturates, 1-100 and 1-5000 grain; Tablets of Yellow Oxide of Mercury; Chloranodyne, in ounce, ¼, ½ and pint bottles; Antiseptic Liquid, Antiseptic Tablets, Disinfectant Powder, Sulphur Bricks and Ethereal Antiseptic Soap.

We shall be pleased to forward, on request, any information desired concerning these products.

PARKE, DAVIS & CO.

DETROIT, NEW YORK AND KANSAS CITY.

PARIS EXPOSITION, 1890. First Prize at the Paris World's Fair, in recognition of superiority of WM. R. WARNER & CO.'S PILLS.

F. Weber & Co.

Successors to JANENTZKY & WEBER,

Manufacturers and Importers of

ARTISTS' MATERIALS,

F. W. & CO.'S SUPERFINE ARTISTS' OIL COLORS,
IN COLLAPSIBLE TUBES.

F. W. & Co.'s Artists Prepared Canvas, Academy Boards, Oil Sketching Paper and Brushes, Papier Maché Plaques, Paint Boxes, Mathematical Instruments, Drawing and Painting Studies, Repousse' Tools and Tapestry Materials, China Colors, Lustre Painting Materials.

ENGINEERS' AND DRAUGHTSMEN'S SUPPLIES, Wax and Paper Flower Materials, NON-POISONOUS CONFECTIONERS' COLORS.

No. 1125 Chestnut Street, Philada.

Branch House, 918 Olive St., St. Louis, Mo.

PHILADELPHIA COLLEGE OF PHARMACY

145 NORTH TENTH STREET.

SEVENTY-SECOND SESSION, 1892-93.—FACULTY.

JOHN M. MAISCH, PHAR. D. Professor of Materia Medica and Botany.
JOSEPH P. REMINGTON, PH. G. Professor of Theory and Practice of Pharmacy.
SAMUEL P. SADTLER, PH. D. Professor of Chemistry.
HENRY TRIMBLE, PH. G. Professor of Analytical Chemistry.

ASSISTANTS TO THE PROFESSORS.

C. B. LOWE, PH. G., Materia Medica and Botany.
FRANK G. RYAN, PH G. Pharmacy.
F. X. MOERK, PH.G. Chemistry.

Two Lectures will be delivered to the **SENIOR CLASS** on each Monday, Wednesday and Friday evening, and to the **JUNIOR CLASS** on each Tuesday and Thursday evening and Saturday afternoon, commencing October 1st, and terminating near end of March.

Field Instruction in Practical Botany will be given by PROF. MAISCH, in Spring and Summer.

The Pharmaceutical Laboratory is under the superintendence of PROF. REMINGTON.

The Chemical Laboratory, under the direction of PROF. SADTLER, assisted by PROF. TRIMBLE, is open daily.

Class Instruction in Analytical Chemistry for the systematic instruction in qualitative analysis and in the application of pharmacopœial tests has been inaugurated for the Senior Students, and a more elementary course for Junior Students.

Fees for Lecture Tickets,	***$45.00***
Matriculation Fee for Students apprenticed to members of College,	***2.50***
For other Students,	***5.00***

Three Free Scholarships will be granted during each Session. Eight prizes, including three Gold Medals, will be awarded at the end of the Course. Students of this College have access to the extensive Library and Museum on the ground floor of the building. A full sketch of the scope and character of the instruction may be seen in the announcements, which will be freely furnished on application to the Actuary, THOS. S. WIEGAND, or either of the Professors.

Pharmaceutical Laboratory

—OF THE—

PHILADELPHIA COLLEGE OF PHARMACY

SPECIAL INSTRUCTION in *Practical Pharmacy*, which is adapted to each student's need, is now given at such times as may suit the student. The laboratory is open continuously from 9 A. M. to 12 M.

CLASS INSTRUCTION in *Operative Pharmacy*, for seniors, on *Monday* and *Wednesday* afternoons; for juniors, on *Thursday* afternoons and always preceded by a short practical lecture explanatory of the subject for the lesson.

For terms, see announcement or apply to

PROF. JOS. P. REMINGTON, Director, or FRANK G. RYAN, Assistant.

BACK VOLUMES

—OF THE—

AMERICAN JOURNAL OF PHARMACY.

To enable the readers of the AMERICAN JOURNAL OF PHARMACY to complete as much as possible their sets of the first forty-two volumes, for which a complete *General Index* has been published the Publishing Committee offer until further notice, the following volumes and single numbers at the *Reduced Rates* mentioned below:

Issued Quarterly, in numbers of 96 pages each.

One Dollar per Volume.

Volume	8	— 1836.
"	9	— 1837.
"	10	— 1838.
"	11	— 1839.
"	12	— 1840.
"	14	— 1842.
"	17	— 1845.
"	20	— 1848.
"	21	— 1849.
"	22	— 1850.
"	23	— 1851.
"	24	— 1852.

Issued Bi-monthly, in numbers of 96 pages each.

One Dollar and fifty cents per Volume.

Volume	25	— 1852.
"	26	— 1854.
"	27	— 1855.
"	30	— 1858.
"	31	— 1859.
"	32	— 1860.
"	33	— 1861.
"	34	— 1862.
"	35	— 1863.
"	38	— 1866.
"	40	— 1868.
"	41	— 1869.

SINGLE NUMBERS TWENTY-FIVE CENTS EACH.

Volume	1	— 1829.	Numbers,	1, 2, 3.
"	3	— 1831.	"	3, 4.
"	4	— 1832.	"	2, 3, 4.
"	5	— 1833.	"	2, 3.
"	13	— 1841.	"	2, 3, 4.
"	15	— 1843.	"	1, 2, 3.
"	16	— 1844.	"	2.
"	18	— 1846.	"	2, 3, 4.
"	19	— 1847.	"	2, 3, 4.
"	28	— 1856.	"	1, 3, 4, 5, 6.
"	29	— 1857.	"	2, 3, 5, 6.
"	36	— 1864.	"	2, 3, 4, 5, 6.
"	37	— 1865.	"	3, 5.
"	38	— 1866.	"	2, 3, 4, 5, 6.
"	39	— 1867.	"	2, 4, 5, 6.
"	42	— 1870.	"	2, 3, 6.

Most of the volumes and numbers in the above list can be supplied to a *limited extent only*, and some few of those *not enumerated*, the Committee are desirous to purchase, and invite those who may have them to spare, to communicate with the *Business Editor*.

TEXT-BOOKS,

FOR STUDENTS IN PHARMACY AND DRUGGISTS,

PUBLISHED BY LEA BROTHERS & CO., Philadelphia.

STILLE, A., M. D., LL. D., and MAISCH, J. M., Phar. D.,

Professor Emeritus of the Theory and Practice of Medicine and of Clinical Medicine in the University of Pennsylvania.

Prof. of Mat. Med. and Botany in the Phila. College of Pharmacy, Sec'y to the American Pharmaceutical Association.

The National Dispensatory. Containing the Natural History, Chemistry, Pharmacy, Actions and Uses of Medicines, including those recognized in the Pharmacopœias of the United States, Great Britain and Germany, with numerous references to the French Codex. New (fourth) edition, thoroughly revised and greatly enlarged. In one magnificent imperial octavo volume of 1794 pages, with 311 fine engravings. Cloth, $7.25; leather, $8.00; half Russia, open back, $9.00. With Denison's "Ready Reference Index," $1.00 in addition to price in any of above styles of binding.

MAISCH, JOHN M., Phar. D.,

Professor of Materia Medica and Botany in the Philadelphia College of Pharmacy.

A Manual of Organic Materia Medica; Being a Guide to Materia Medica of the Vegetable and Animal Kingdoms. For the use of Students, Druggists, Pharmacists and Physicians. New (fourth) edition. In one handsome royal 12mo. volume of 523 pages, with 257 illustrations. Cloth, $3.00.

ATTFIELD, JOHN, Ph. D.,

Professor of Practical Chemistry to the Pharmaceutical Society of Great Britain, etc.

Chemistry, General, Medical and Pharmaceutical; Including the Chemistry of the U. S. Pharmacopœia. A Manual of the General Principles of the Science, and their Application to Medicine and Pharmacy. A new American, from the tenth English edition, specially revised by the Author for America. In one handsome royal 12mo. volume of 728 pages, with 87 illustrations. Cloth, $2.50; leather, $3.00.

DUNGLISON, ROBLEY, M. D.,

Late Professor of Institutes of Medicine in the Jefferson Medical College of Philadelphia.

MEDICAL LEXICON; A Dictionary of Medical Science; Containing a Concise Explanation of the Various Subjects and Terms of Anatomy, Physiology, Pathology, Hygiene, Therapeutics, Pharmacology, Pharmacy, Surgery, Obstetrics, Medical Jurisprudence and Dentistry, Notices of Climate and of Mineral Waters; Formulæ for Officinal, Empirical and Dietetic Preparations, with the Accentuation and Etymology of the Terms, and the French and other Synonymes, so as to constitute a French as well as an English Medical Lexicon. Edited by RICHARD J. DUNGLISON, M. D. In one very large and handsome octavo volume of 1139 pages. Cloth, $6.50; leather, raised bands, $7.50; very handsome half Russia, raised bands, $8.00.

FOWNES, GEORGE, Ph. D.

A Manual of Elementary Chemistry; Theoretical and Practical. Embodying WATTS' *Inorganic Chemistry*. New American edition. In one large royal 12mo. volume of 1061 pages, with 168 illustrations on wood and a colored plate. Cloth, $2.75; leather, $3.25.

HOFFMANN, F., A. M., Ph. D., and POWER, F. B., Ph. D.,

Public Analyst to the State of New York. *Prof. of Anal. Chem. he Phil. Coll. of Phar.*

A Manual of Chemical Analysis, as applied to the Examination of Medicinal Chemicals and their Preparations. Being a Guide for the Determination of their Identity and Quality, and for the Detection of Impurities and Adulterations. For the use of Pharmacists, Physicians, Druggists and Manufacturing Chemists, and Pharmaceutical and Medical Students. Third edition, entirely rewritten and much enlarged. In one very handsome octavo volume of 621 pages, with 179 illustrations. Cloth, $4.25.

PARRISH, EDWARD,

Late Professor of the Theory and Practice of Pharmacy in the Philada. College of Pharmacy.

A Treatise on Pharmacy. Designed as a Text-book for the Student, and as a Guide, for the Physician and Pharmaceutist. With many Formulæ and Prescriptions. Fifth edition, thoroughly revised by THOMAS S. WIEGAND, Ph. G. In one handsome octavo volume of 1093 pages, with 256 illustrations. Cloth, $5; leather, $6.

SIMON, W., Ph. D., M. D., *Professor of Chemistry and Toxicology in the College of Physicians and Surgeons, Baltimore, and Prof. of Chem. in the Maryland Coll. of Pharmacy*

Manual of Chemistry. A Guide to Lectures and Laboratory Work for Beginners in Chemistry. A Text-book, specially adapted for Students of Pharmacy and Medicine. New (second) edition. In one 8vo. vol. of 478 pages, with 44 woodcuts and 7 plates, mostly of actual deposits, with colors illustrating 56 of the most important chemical reactions. Cloth, $3.00.

THE

Chemical Laboratory

—OF THE—

PHILADELPHIA COLLEGE OF PHARMACY.

Winter Term, - October 1st to March 1st.

Spring Term, - - - April 1st to July 1st.

STUDENTS MAY JOIN AT ANY TIME DURING THESE TERMS.

Open daily, from 9 A. M. to 1 P. M., for **individual instruction**, and during the Winter Term, on Wednesday, Thursday and Friday afternoons for **class** instruction.

Advance students or **Graduates in Pharmacy** may make arrangements for remaining all day. The Laboratory is fully equipped with apparatus for all kinds of chemical investigation in **proximate and ultimate analysis.** Special opportunities are afforded to those engaged in **plant analysis,** for grinding, drying and exhausting drugs, and for recovering their solvents by distillation. Students may also pursue courses in the analysis of ores and silicates; and in the analysis of, and detection of impurities in, foods. The preparation of organic and inorganic compounds will receive a full share of attention, as well as the detection of impurities in them and in officinal compounds.

For particulars concerning terms consult the College Announcement or address the Director,

PROF. HENRY TRIMBLE,

145 N. Tenth Street, Philadelphia.

STEARNS'
CASCARA-AROMATIC

Is a fluid extract (not a cordial, syrup or other *dilute* preparation.) of prime and selected two year old bark (Fresh bark contains a ferment which produces griping.).

Cascara Aromatic is sweet in taste (which children and women especially appreciate.) instead of being bitter, as is the ordinary fluid extract, powerful (Its dose is only ¼ to 1 fluiddrachm.) yet gentle in effect, and in addition does not gripe (This, next to its taste, is its most valuable property, as ordinary bitter fluid extracts do.).

SURELY AN IDEAL LAXATIVE.
PRESCRIBED BY PHYSICIANS EVERYWHERE.

FREDERICK STEARNS & CO.,
MANUFACTURING PHARMACISTS,
DETROIT, MICH.

WE GIVE SPECIAL ATTENTION TO THE

PRINTING
—OF—
CATALOGUES, PRICE-LISTS AND CIRCULARS.

Our Designs are tasteful. Our prices are moderate. Our facilities for promptly filling all orders, whether large or small, are unsurpassed.

PRINTING ALSO IN

German, French, Spanish or Italian.

(INCLUDING TRANSLATION.)

EDWARD STERN & CO.
BOOK, NEWSPAPER AND JOB PRINTERS,
N. E. Cor. Tenth and Filbert Sts., Philadelphia.

EUROPHEN.

EUROPHEN is the most interesting of the new Iodine compounds, for it not only acts as a perfect substitute for Iodoform, but seems likely to largely displace Mercury and Iodine in the internal treatment of Constitutional Syphilis. This at least is the opinion of Seifert, Eichhoff and Petersen, who used it hypodermically in this condition, with surprisingly good results. The same writers found also, that **EUROPHEN** possesses remarkable curative power in Obstinate Dermatoses, in Atrophic and Secretory Rhinitis, in Ulcerative Conditions, in Inflammations of the Mucous Surfaces, etc.

EUROPHEN is prepared only by the Farbenfabriken, formerly Friedr. Bayer & Co. of Elberfeld, and is supplied in ounces.

PHENACETINE-BAYER.

The safest of antithermics, and the most prompt and effective in action, **PHENACETINE-BAYER** continues to hold its high position as an Antipyretic, Analgesic, Anti-rheumatic and Anti-neuralgic. In all Acute Inflammatory Fevers, Bronchitis, Phthisis, Rheumatism, Influenza, Migraine, Whooping-cough, etc., it has given most satisfactory results.

PHENACETINE-BAYER prepared solely by the Farbenfabriken, formerly Friedr. Bayer & Co., of Elberfeld, is supplied by us in ounces.

We prepare pills and tablets of **PHENACETINE-BAYER** containing 2, 3, 4 and 5 grains each, also pills in combination with Salol or Caffeine.

SULFONAL-BAYER.

SULFONAL-BAYER is justly regarded as a true nerve sedative, as well as a hypnotic, on account of its prolonged good effect. It is of the highest value in the Insomnia of Nervous and Febrile conditions, in the Symptomatic Treatment of Insanity, and all cases in which Hypnotics are indicated. To obtain its best effects, **SULFONAL** must be administered in a manner suited to its nature.

SULFONAL-BAYER is prepared solely by the Farbenfabriken, formerly Friedr. Bayer & Co., of Elberfeld, and is supplied by us in ounces; also in form of tablets and pills.

ARISTOL.

ARISTOL, as a succedaneum of Iodoform, has met with remarkable success. It is safe and effective in all Ulcerations, in Skin Diseases, in Lesions of the Eye, Ear, Nose, Mouth and other cavities, in Dysentery, Gonorrhœa, Ivy-poisoning, Burns, Scalds, Blisters, and all external Traumatisms. It is used in ointments, powders, crayons, suppositories, balls, oils, sprays, collodions, plasters, tampons, bandages, etc.

ARISTOL GAUZE is now widely used by American surgeons in place of Iodoform, so long offensive to both Physician and patient.

ARISTOL, prepared only by the Farbenfabriken, formerly Friedr. Bayer & Co., of Elberfeld, is supplied by us in ounces.

New descriptive pamphlets on the above preparations mailed to applicants.

W. H. Schieffelin & Co.

NEW YORK.

LEHN & FINK

128 William St. P. O. Box 3114. || **Wholesale Druggists.** || NEW YORK.

ADVERTISEMENT.

Lehn & Fink,

Importers, Wholesale Druggists, Manufacturing Chemists.

Crude and Pure Drugs, Fine Chemicals and Alkaloids, Botanical Products, New Remedies, Essential Oils and Pharmaceutical Preparations.

Office and Warehouse: 128 WILLIAM ST.
Laboratory and Storage: 33 & 35 GOLD ST.
Storage: 283 PEARL ST.
Cable Address: ROSTRUM.
Address all correspondence to Office, or P. O. Box 3114, NEW YORK CITY.

WE SOLICIT

direct orders by mail, and promise careful and prompt attention for such favors.

Our salesmen carry full line of choice samples, and visit every part of the United States at regular intervals; on request we will instruct our salesmen to call on pharmacists who are not already customers of our house.

Correspondence solicited and promptly responded to.

Write for sample copy of our monthly, NOTES ON NEW REMEDIES; also, for copy of our Specialty Price-List, which will prove interesting and valuable for reference.

ORDERS BY MAIL

receive prompt and most careful attention; we always supply the best, select goods at lowest market prices. New York is the DRUG MARKET of America, and our customers share the advantages we possess in procuring the best goods at bottom values in this market. Our own importations are large, varied and comprehensive; we draw our supplies direct from first hands, and are headquarters in this country for most products of European origin in our business. We have our own buyers in the markets of London, Hamburg, Amsterdam, Trieste and elsewhere, and rank second to no other house in America in the resources and advantages of our connections abroad.

Now Ready for Delivery.

Helbing's Modern Materia Medica.

FOR

Pharmacists, Medical Men and Students.

By H. HELBING, F.C.S., London, Eng.

THIRD ENLARGED EDITION.

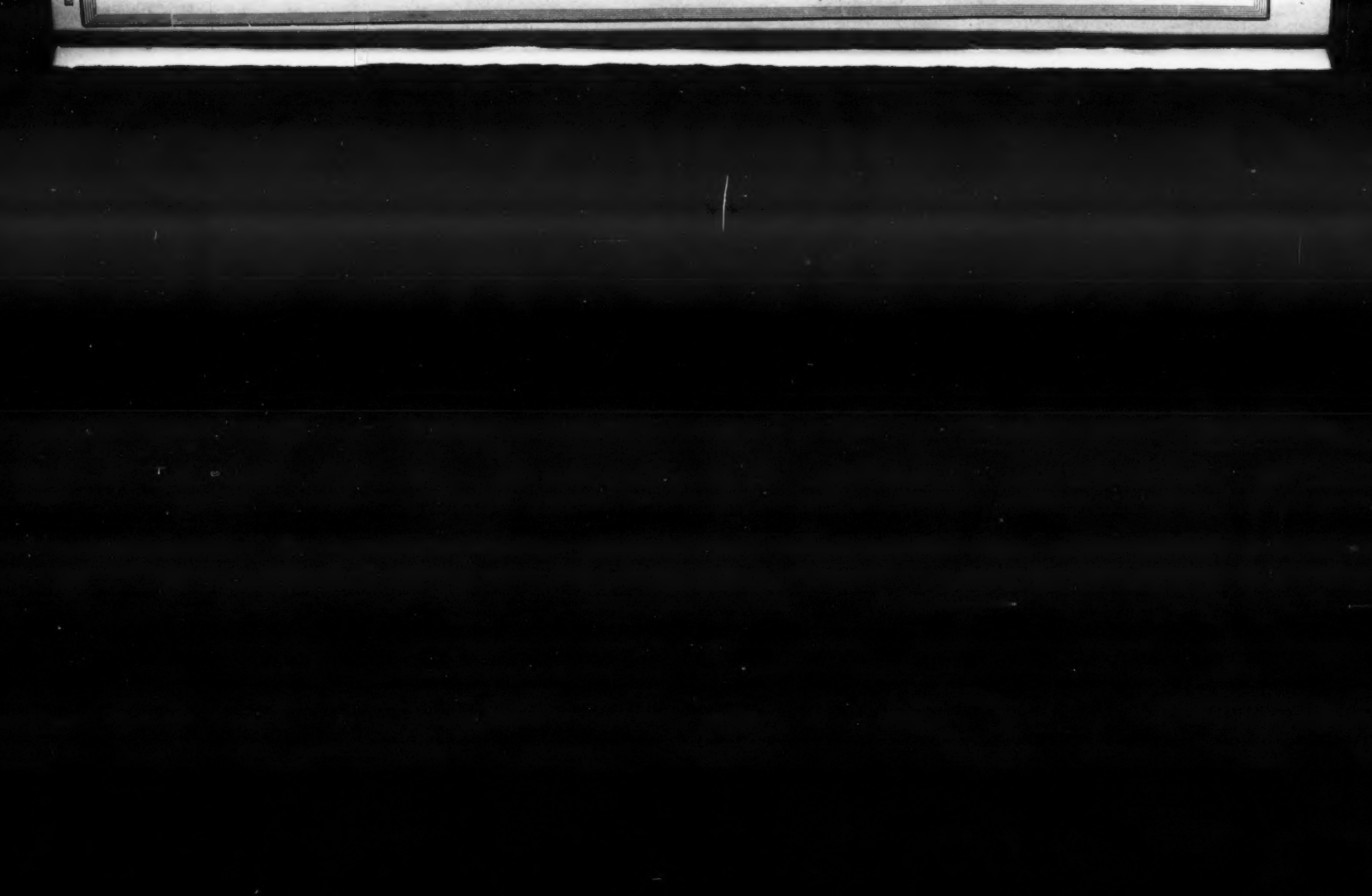
Handsomely bound in cloth; 8vo, 212 pages.
PRICE, $1.00, post-paid.

This edition will prove the most complete and satisfactory reference book on New Remedies yet published in any language. The previous edition achieved great popularity, and received high praise from the press, teachers, and pharmacists generally. The present revised edition will far exceed the former; it will be almost treble in size and contents; the monographs have all been re-written in the light of latest reports and matured opinions; every new remedy up to date, and legitimately belonging in materia medica, including asaprol and diaphtherin—introduced only two weeks ago—will be described; the index contains over 600 references, forming an unabridged reference book of new remedies and synonyms.

In a word, the book is as nearly perfect as it can be made, and no physician or pharmacist can afford to be without it.

Address all orders to the publishers,

LEHN & FINK,
128 William St., New York.



Entered at the Post Office at Philadelphia in accordance with Section 189 of the Postal Laws and Regulations.

Vol. 64 AMERICAN No. 12

JOURNAL OF PHARMACY.

PUBLISHED BY AUTHORITY OF THE

PHILADELPHIA COLLEGE OF PHARMACY.

Publishing Committee:

CHARLES BULLOCK, HENRY N. RITTENHOUSE, JAMES T. SHINN, T. S. WIEGAND,

AND THE EDITOR.

Editor: JOHN M. MAISCH.

Collaborators: Geo. M. Beringer, A.M., Ph.G., Joseph W. England, Ph.G., Frank X. Moerk, Ph.G., Professor Jos. P. Remington, Ph.M., " S. P. Sadtler, Ph.D., " Henry Trimble, Ph.G.

Price, $3 per Annum, in advance. Issued in Monthly numbers of not less than 48 pages.

Single No. 30 cts. } Fourth Series. DECEMBER, 1892. Vol. XXII, No. 12

CONTENTS.

On the Medicinal Uses of Compressed Gases. By Clement B. Lowe, Ph.G., M.D., . . . 603
Liatris Spicata. By William F. Henry, Ph.G., . 601
Abstracts from the French Journals. Translated for THE AMERICAN JOURNAL OF PHARMACY, 604
Gleanings from the German Journals. By Frank X. Moerk, Ph.G. 608
Amorphous Boron. By H. Moissan, . . . 616
Action of Nitric Acid on Metals. By C. Montemartini, ... 618
Sesquiterpenes, ... 620
Notes on Ether as a Menstruum in Medication by the Skin. By Sir James Sawyer, M.D., Lond., F.R.C.P., Consulting Physician to the Queen's Hospital, Birmingham, . . . 624
Coloring Matters of the Vine: Ampelochroic Acids. By A. Gautier. 626
Detection of Higher Alcohols in Spirits of Wine. By C. Bardy, ... 627
Koumiss. By D. H. Davies, ... 629
The Arrowroot Plantations of Coomera and Pimpama, Queensland. By H. L. Thompson, . 631
Solutions of Medicinal Resins. By Harold Wyatt, Junr., ... 633
Thyroid Extract. Its Preparation for the Treatment of Myxœdema. By Edmund White, B. Sc., Lond. F.I.C., Pharmaceutist to St. Thomas' Hospital, ... 634
Microscopical Examination of Pure and Unadulterated Butters. By Jean Ferdinand, . . 636
Aconitine. By A. Ehrenberg and C. Kurfuerst, 636
On the Volumetric Determination of the Alkaloids. By L. Barthe, ... 638
Condurangin. By G. Carrara, ... 640
Reviews and Bibliographical Notices, . . . 646
Notes Relating to the Solanaceous Bases. By Dr. O. Hesse, ... 641
Minutes of the Pharmaceutical Meeting, . . 644
Varieties, ... 648

NOTICE TO READERS.

This Journal is devoted to the advancement of PHARMACEUTICAL KNOWLEDGE and to the advocation of a MORE THOROUGH EDUCATION and PRACTICAL TRAINING for all persons engaged in PREPARING and DISPENSING medicines, drugs and chemicals.

It embodies a large amount of information EXTREMELY VALUABLE TO APOTHECARIES, DRUGGISTS and PHYSICIANS—comprehending, in fact, a faithful record of the development of PHARMACEUTICAL SCIENCE AND INVENTION both in Europe and America, during the period of its issue, commencing with 1829.

Besides the abstract and applied science embodied in the JOURNAL, much practical information and a LARGE NUMBER OF FORMULAS are contained in it, including many which, though not official, are valuable and in use.

To render all this more available, a very complete GENERAL INDEX to the FIRST 42 VOLUMES has been published and may be obtained IN PAPER at $1.50; IN CLOTH at $2.00 per copy. Also a DECENNIAL INDEX embracing the ten volumes (43 to 52, year 1871 to 1880 inclusive) at 50 cents each in paper covers.

An ADVERTISING SHEET is appended to each number, in which suitable advertisements will be inserted, a proper discrimination being observed in relation to their character.

Address all papers for publication, etc., to the Editor JOHN M. MAISCH.

All communications relating to subscriptions, advertisements, etc., to the Business Editor, H. H. WOLLE, 145 North Tenth Street, Philadelphia, Pa.

Edward Stern & Co., Prs., N. E. Cor. 10th and Filbert Sts., Phila'a

Our Readers will find it to their advantage to carefully consult the Advertising pages when desiring to correspond with STRICTLY FIRST-CLASS PARTIES.

RENEW YOUR SUBSCRIPTION FOR 1893.

FOR SALE.—Chicago Drug Store; sales $8,000 per year. Good prescription business. Profits, $2,700. Low rent; long lease. Price, $5,000. For particulars, etc., address
"DRUGS," care N. CHESMAN, 605 Home Insurance Building, Chicago.

UNIVERSITY OF PENNSYLVANIA—MEDICAL DEPARTMENT.

The 127th ANNUAL WINTER SESSION will begin Monday, October 3, 1892, at 12 M., and continue seven months.

THE PRELIMINARY SESSION has been discontinued. The SPRING TERM begins early in May, 1893.

The Curriculum is graded and three annual Winter sessions are required. Practical Instruction, including laboratory work in Chemistry, Histology, Osteology and Pathology, with Bedside Instruction in Medicine, Surgery, Gynæcology, and Obstetrics are a part of the regular course and without additional expense. **With the session beginning October 2, 1893, a four-year compulsory course will be instituted.** For catalogue and announcement containing particulars, apply to DR. JOHN MARSHALL, Dean, 36th and Woodland Avenue, Phila.

The First Pharmacopœia Published in the United States.

A small number of copies of this interesting little work have been printed, paged to correspond with the original. Copies may be obtained at 25 cents each, by addressing,
H. H. WOLLE, 145 North Tenth Street, Philadelphia.

FRED. D. MAISCH, Photographer,

LANTERN SLIDES. VIEWS OF CHICAGO.
Micro-Photography a Specialty. Negatives Supplied for Book Illustrations.
83 RANDOLPH STREET, CHICAGO.

The third of the present series of Pharmaceutical Meetings will be held at the College of Pharmacy, Tuesday, 20th inst., at 3.30 P. M. All interested in the progress of Pharmacy are invited to be present and to take part in the proceedings. T. S. WIEGAND, Registrar.

E. FOUGERA'S MEDICINAL PREPARATIONS.

NO AGENTS

LANCELOTS CIGARETTES FOR ASTHMA

Sole Proprietor and Manufacturer of Delluc's and Lancelot's Specialties.

PRICE-CURRENT MAILED ON DEMAND.

ADDRESS: 309 EIGHTH STREET, - BROOKLYN, NEW YORK.

AGENTS FOR THE AMERICAN JOURNAL OF PHARMACY.

Authorized to receive Subscriptions and Advertisements.

C. PARRISH, 72 Henry St., Brooklyn, N. Y.
SAMUEL A. D. SHEPPARD, 1129 Washington, St., Boston.
CHAS. T. P. FENNEL, Eighth and Vine Sts., Cincinnati, Ohio
ALBERT E. EBERT, 426 State St., Chicago, Ill.
WM. T. WENTZELL, 322 Polk St., San Francisco, Cal.
JAMES S. ROBINSON, Second and Madison Sts., Memphis, Tenn.
JOHN C. FALK, 1006 Olive St., St. Louis, Mo.
BURROUGHS, WELLCOME & CO. Snow Hill Buildings, London, England.

Bishop's Granular Effervescent Salts.

On July 1, 1891, we made a number of important changes in the prices of *Bishop's Granular Effervescent Salts*, of which we have been for over twenty years, Sole Agents for the United States.

In Great Britain and on the Continent, leading chemists unite in the feeling that the *Granular Effervescent Salts*, MANUFACTURED BY ALFRED BISHOP & SONS, LONDON, ENG., have uniform superiority over those of any other chemical firm; and after our own experience in the introduction and sale of these goods, covering a period of almost a quarter of a century, we are thoroughly convinced of their high grade.

Recent additions to List indicated by heavy types.

	Grains in drachm.	4 oz. des.
Acid Salicylic	5	$6 00
Antifebrine	5	8 00
Antipyrine	5	15 00
Bismuth Ammonia-Citrate	2	6 50
Caffeine Citrate	1	10 00
Caffeine Hydrobromate	1	10 00
Cerium Nitrate	2	6 50
Cerium Oxalate	2	5 00
Caffeine Citr. with Brom. Potassium, (Caffeine Citrate 1; Brom. Potassium 10)		10 00
Exalgine	2	7 50
Iron, Quinine and Strychnia, Ortho-phosphate. (Phos. Iron 2; Quinine 1; Strychnia 1-100)		10 00
Kissingen (as the natural water)		4 00
Lithiated Potash		10 00
Lithium Benzoate	4	10 00
Lithium Citrate	2	10 00
Lithium Salicylate	5	10 00
Magnesian Aperient		4 00
Magnesium Citrate		4 00
Nux Vomica Extract	1-12	5 50
Pepsin and Bismuth, (Sacch. Pepsin 5; Am. Cit. Bismuth 2)		7 50
Pepsin, Bismuth and Strychnia. (Sacch. Pepsin 5; Am. Cit. Bismuth 2; Strychnia 1-100)		8 00
Pepsin (Sacch.)	5	7 00
Phenacetine	5	10 00
Potassium Benzoate	2	6 00
Potassium Bicarbonate	4	4 00
Potassium Citrate	10	5 00
Potassium Nitrate	5	4 00
Potassium Bromide	2	5 00
Potassium Iodide	2	5 50
Salicine	5	8 00
Seidlitz (officinal strength)		4 00
Seltzer Salts (as the natural water)		4 00
Soda Cit. Tart.		4 00
Sodium Phosphate	10	6 00
Sodium Salicylate	5	10 00
Sodium Sulphate	10	6 00
Vichy Salts (as the natural water)		4 00

The above prices are subject to our usual discount.

BISHOP'S

Mr. Bishop was the first to introduce Granulated Salts to the notice of medical men.

The annexed indorsement by Dr. Redwood, the highest authority in the London Pharmaceutical Society, is one of the many certificates received by him:

"Since the introduction by Mr. Bishop of saline medicines in the granular effervescent form, their use has undergone a great extension, and this method of administering medicines seems to be very generally approved. It is especially suited for the administration of carbonate of iron, and the saline constituents of some mineral waters, but it is applicable to many other medicines, the use of which has been greatly increased by making them palatable. I have examined a great many samples of Mr. Bishop's granulated preparations, obtained at various times and from different sources, and have found them to rate very uniform in character, fully charged with carbonic acid and obviously made with great care and accuracy.

THEOPHILUS REDWOOD, Ph.D."

SALTS.

John Wyeth & Brother,

Sole Agents for the United States. **PHILADELPHIA.**

Armour's Glycerole Pepsin

Is a permanent and concentrated solution of the ferment, constant in strength, and peculiarly adapted to use in all liquid combinations. We guarantee that each 10 minims of this elegant preparation contain one grain of our standard pepsin (1:2500). It is freely and perfectly miscible with any appropriate medium.

Armour & Company
Chicago.

"That the Digestive Ferments have now assumed great importance as objects of manufacture and of medicinal use is unquestionable. Messrs. Fairchild Bros. & Foster may justly be congratulated upon the part which they have played in their development and in obtaining recognition of their value."—*Pharmaceutical Era, November, 1887.*

FAIRCHILD BROS. & FOSTER,
New York City.